Syllabus of courses offered during   2018 – 2019

Bachelor of Commerce (B.Com) Semester-I

1 -Financial Accounting-I

Unit – I Financial Accounting
Meaning, objectives and principles of Accounting, Accounting concepts & Conventions, Accounting Standards- AS 1 to AS 10. Final accounts of Sole Traders. **(Theory & Numerical)**

Unit – II Hire Purchase Accounts
Meaning of Hire Purchase Accounts, Features, Merits and Demerits of Hire Purchase System, Distinction between Hire Purchase and Instalment System.
(Theory & Numerical Excluding Instalment System and Repossession of Assets)

Unit – III

Final Accounts of Co - Operative Societies: (As per Maharashtra Co-Operative Societies Act 1960)- Introduction, Types of Co-operative societies Preparation of Trading & Profit and Loss A/C and Balance Sheet. **(Theory & Numerical)**

Unit – IV
Joint Venture Accounts

Meaning, Distinction between Joint venture and Partnership, Methods of joint venture accounting**. (Theory & Numerical on Centralized & Decentralized Method)**

The Financial year ends on 31st March.

2: Business Organization

Unit – I

Nature and scope of business: Meaning and definition of business, characteristics, objectives of business, classification of business activities, Industry, Service, Commerce & Trade. Social Responsibility of Business towards different groups.

Unit – II
Forms of Business Units: Meaning, Characteristics, Advantages and Disadvantages of Sole Trader, Partnership, One Person Company, Private Company, Joint Stock Company- Concept, Classification, Service sector business: - meaning, types includingBPO and KPO, advantage its role in economy

Unit - III
Organization: Meaning, Definition ,Concept and functions of Organization, Principles of Organization, Types of Organization- Line and Staff, Modern types of organizations- Project, Matrix, Formal and Informal Organization, Advantages and Disadvantages.

Unit IV

Recent Trends in Business Organization: Internal constituents of the Business Organization; key managerial personnel (KMP); chairman- qualities of a chairman, powers, responsibilities and duties of a chairman; chief executive officer (CEO), role and responsibilities of the CEO; E-commerce, E-business, E-banking.

3: Company Law

Level of Knowledge: - Basic Conceptual Knowledge.

Objective: To make aware the students with basic concept of company law[The Company Act 2013 with Amendments up to June 2016]

UNIT – II
(i)   Background of New Company Act 2013.
(ii) Corporate Personality – Company, Meaning of Company, Characteristics of a Company, Lifting of Corporate Veil
(iii) Kinds of Company- Private Company, Public Company, Company limited by Share, Company Limited by guarantee, Unlimited Company, Association not for profit, Government Company, Foreign Company, Holding and Subsidiary and associate company with features of all kinds of company.
(iv) Promotion and incorporation of company- stages in formation and incorporation of company, registration and commencement of business, Certificate of Incorporation

UNIT – II
(i)   Memorandum of Association- Meaning, Definition, Importance and Content of Memorandum of Association.
(ii) Articles of Association – Meaning, Definition, Importance and content of Articles of association.
(iii) Private Placement and Prospectus: Meaning and definition of private placement and prospectus, public offer, types of prospectus- Deemed prospectus, Shelf prospectus, Red Herring Prospectus, Abridge prospectus.
(iv) Misrepresentation in prospectus, Consequences of misrepresentation and remedies for misrepresentation in prospectus.

UNIT- III
(i)   Share and share capital- Meaning and nature of capital and share capital, kinds of share- equity, preference, sweat equity, bonus, employee stock option scheme, and Right issue.
(ii) Debt Capital (Borrowing and Debenture)- Meaning and nature of debt and debtcapital, Types of different types of borrowing
(iii) Difference between- Share and debenture, owned capital and debt capital.
(iv) Depositories and dematerialization of securities- meaning and nature of depositories, procedure of dematerialization of securities.

UNIT – IV

(i)   Membership in a company – Meaning of shareholder and member, distinction between shareholder and member, kinds of member.

(ii) Procedure to become member and shareholder of a company, Concept of Transfer and Transmission of Securities (Share and Debenture)

(iii) Directors – Meaning, Appointment, Power and Duties, Managing Director and Whole Time Director – Appointment and Qualification

4: Business Economics – I

Unit I: Nature and Scope of Business Economics
Business Economics-Meaning, scope and objectives of business economics. Nature and types of business decisions. Role and social responsibility of business & business economist. Micro and Macro Economics- Definition, scope, merits and demerits.

Unit II: Theory of Consumption
Law of Demand, Demand determinants, Changes in demand, Indifference Curve Concept-Definition, properties, importance of indifference curves. Elasticity of Demand-Concept, definition, kinds, measurement of elasticity of demand, Factors influencing elasticity of demand, Importance of elasticity of demand. Demand Forecasting- Meaning, need, importance, methods of demand forecasting.

Unit III: Theory of Production
Concept of Production Function- Concept, definition, Types of Products, Total Production, Average Production, Marginal Production. Law of Variable Proportions- Assumptions, significance & limitations. Isoquant Curves- Definition, general properties of Isoquant curves, Expansion Path. Law of Returns to Scale, Internal and External Economies and Diseconomies of Scale, Ridge Lines. Theories of Population - Malthusian Theory of Population, Optimum Theory of Population, Demographic Transition Theory of Population and Criticisms. Law of Supply.

Unit IV- Theory of Cost and Revenue
Law of Supply & Criticisms, Factors influencing supply. Concept of Cost in the Short &Long Run- Accounting Cost, Economic Cost, Opportunity Cost, Fixed Cost, Variable Cost, Direct and Indirect Costs, Real Cost, Explicit & Implicit Costs, Money Cost, Total Cost, Average Cost, Marginal Cost, Selling Costs. Revenues - Total Revenue, Average Revenue, Marginal Revenue and their Relationship.

5- Compulsory English

Unit –I Short Stories:
1. The Gifts by O Henry
2. The Quality by J. Galsworthy
3. The Axe by R. K. Narayan

Unit –II Poems:

1. You turned away yourself by Kabir
2. Mending wall by Robert Frost
3. Unknown Citizen by W.H. Auden

Unit –III Essays:

1. Tolerance by E.M. Forster
2. The Philosophy of Pleasure by Fulton J. Sheen
3. On Painted Face by A. G. Gardiner

Unit –IV

A) I) Synonym/Antonym of Given words (Match the following format)

II) One Word Substitute
B) Business Correspondence:
   Job Application Letter,Interview Call Letter,Job Offer Letter

C) Comprehension of an Unseen Passage

D) Precis Writing

6-Marathi

प्रश्न क्र.	घटक क्र.	अभ्यासक्रम	गुण	शेरा
१	१	समकालीन राष्ट्रीय, सामाजिक समस्यावर आधारित (चार पर्यायांपैकी एका विषयावर, शब्द मर्यादा-५००)	२०	
२	२	गद्य विभाग : पाठ्य पुस्तक : भाषा दर्शन भाग एक	३५	
		१. लोकशाहीचे भवितव्य (डॉ. बाबासाहेब आंबेडकर) २. नौका (प. भा. भावे) ३. अस्पृश्यांचा आधारवड (शिवाजी सावंत) ४. बेगड (योगीराज वाघमारे) ५. उमा (वि. स. जोग)		
३	३	पद्य विभाग : पाठ्य पुस्तक : भाषा दर्शन भाग एक	३५	
		१. ज्ञानेश्वरांच्या विराण्या (संत ज्ञानेश्वर) २. मन (बहिणाबाई चौधरी) ३. गणपतवाणी (बा. सी. मर्ढेकर) ४. गिरणीची लावणी (नारायण सुर्वे) ५. माउली भुकेले बेट (सुधाकर गायधनी)		
४	४	व्यावहारिक मराठी	१०	
		१. पत्रलेखन २. इतिवृत्त लेखन		

7-Hindi

Unit	Particulars
Unit - 1	निबंध
Unit - 2	गद्य विभाग - पाठ्यपुस्तक साहित्य वीथिका
1)	गपशप (निबंध) नामवर सिंह
2)	सच्ची वीरता (निबंध) सरदार पूर्णसिंह
3)	कफन (कहानी) प्रेमचंद
4)	चीफ की दावत (कहानी) भीष्म साहनी
5)	शरणागत (कहानी) वृन्दावनलाल वर्मा
Unit - 3	पद्य विभाग
इकाई - 1)	कबीर के दोहे कबीरदास
2)	बाल-लीला सुरदास
3)	भक्ति, नीति के दोहे बिहारी
4)	वर दे, वीणावादिनी वर दे । सूर्यकांत त्रिपाठी 'निराला'
5)	हिमाद्रि तुंग श्रृंग से जय शंकर प्रसाद

Unit	Particulars	From
5	)बादल को घिरते देखा है नागार्जुन	
Unit - 3	**पारिभाषिक शब्दावली** वाणिज्य सम्बन्धी पारिभाषिक शब्द	
1)	Affiliated	
2)	Agriculture	
2)	Abreviation	
4)	Allowance	
5)	Indigenous Bank	
6)	Borrowing	
7)	Consignment	
8)	Expansion	
9)	Indemnity	
10)	Voyage etc.	
Unit - 5	**कल्पना विस्तार**	
1)	जैसा देश वैसा भेष ।	
2)	पराधीन सपने हूँ सुख नाही ।	
3)	जहाँ सुमति वहाँ नाना सम्पति ।	
4)	कर्म बिना सिध्दान्त मिथ्या है।	
5)	नेत्रदान महादान	
6)	जो जैसा करता है वैसा भरता है ।	
7)	परिवर्तन ही गति है ।	
8)	साँच को आँच नाही ।	
9)	एकता में बल होता है ।	
10)	भय मनुष्य का सबसे बड़ा शत्रु है ।	

8 - Supplementary English

Unit 1- Prose

1. A New Star Rises- Jawaharlal Nehru
2. Mahatma Gandhi- Louis Fischer
3. Jagdish Chandra Bose- Aldous Huxley
4. My Greatest Olympic Prize- Jesse Owens
5. Eating for Health- Rajkumari Amrit Kaur

Unit 2 - Poetry

1. Virtue- George Herbert
2. Solitude- Alexander Pope
3. How Sleep the Brave- William Collins

Non-Textual portion-

Unit 3 – Writing Skills

(A) Social Correspondence:

Letter of Congratulations, Letter of Condolence, Informal Invitation

(B) Writing Classified Advertisements

Unit 4 – Grammar

Spotting errors in the use of - (1) Articles   (2) Subject-Verb Agreement

Prescribed Text- *Zenith*- An Anthology of Prose and Poetry (Raghav Publishers)

Bachelor of Commerce (B.Com) Semester-II

9: Statistics and Business Mathematics

Unit – I Statistics & Measures of Central Tendency
Meaning, Scope, Importance, Functions and Limitations of Statistics. Collection of data, Tabulation and Classification, Frequency distribution.
Mean, Median, Mode, Geometric Mean and Harmonic Mean **(Theory & Numericals)**

Unit – II
Dispersion- Meaning and significance of dispersion, Methods of measuring dispersion, Mean Deviation, Standard Deviation, Quartile Deviation, co-efficient of variation **(Theory & Numericals)**

Unit – III
Skewness-Absolute Measures of Skewness, Relative Measures of Skewness, Karl Pearson's Coefficient of Skewness, Bowley's Coefficient of Skewness. **(Numericals)**

Unit – IV
Business Mathematics:- Ratio Proportion, Percentages, Simple & Compound Interest, Profit/ Loss. **(Numericals)**

10: Business Management

Unit I

Introduction: Meaning, Definition ,concept and types of management. Principles of business Management. Scope and significance of business management. Process of business management. Function of business Management. Management as ascience or art.

Unit II

Planning: - Meaning, Nature and Characteristics, Importance, Types & Components of Planning. **Decision Making**: Meaning, characteristics & importance of decision making. Traditional and Modern techniques of Decision-Making.

Unit – III

Delegation of Authority:-– Meaning, Elements, Advantages, & Obstacle of Delegationof Authority. Centralization and decentralization of authority and its merits and demerits.
Co-ordination & Controlling: Meaning, Concept and principles of Coordination,Internal & External Coordination. Meaning, concept and elements of control.

Unit IV
Recent trends in management:

Management of Change Management of Crisis, Total Quality Management, Stress Management, International Management.

11 : Secretarial Practice

Level of Knowledge: - Book Conceptual Knowledge.

Objective: To make aware the student with various function, duties and responsibilities of company secretary and Secretarial Practice
[The Company Act 2013 with Amendments up to June 2016]

UNIT – I

(i) Procedure for Incorporation of Companies, Conversion of Companies – Private Limited to Public Limited and Public Limited to Private Limited
(ii) Procedure for Alteration of Memorandum of Association and Article of Association
(i) Company Secretary – Meaning, Qualification and Functions/ Role
(ii) Directors – Procedure for Appointment of Directors and Director's Identification Number (DIN)- allotment and surrender
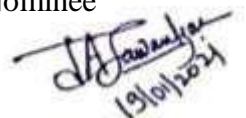
UNIT- II

(i) Types and characteristics of company meeting, statutory, board, general and extra ordinary meeting, and meetings of committee of director.
(ii) Agenda, Notice and provision regarding quorum of Board meeting, Annual General Meeting and Extra ordinary General Meeting
(iii) Voting and resolution- Meaning of poll, postal ballot and E-Voting, Meaning of ordinary and Special Resolution.
(iv) Circular Resolution, Explanatory statement, Ordinary and special Business to be transacted in meetings.

UNIT – III

(i) Report Writing - Essential and content of Board Report and Annual Report.
(ii) Concept of secretarial audit, Secretarial standards, corporate social responsibility and corporate governance, National Financial Reporting Authority.
(iii) E-Governance and E-Filling- Meaning, features and procedure of E-Governance and E-Filling, MCA-21

UNIT – IV

(i) Key managerial personnel- Appointment and function of managing director, whole time director and manager.
(ii) Procedure for appointment of Additional Directors, Alternate Directors, Nominee Directors.

(iii)   Managerial Remuneration - Remuneration of managing director, whole time director or manager.

(iv)   Provisions regarding resignation, removal of directors, Casual vacancy

12 : Business Economics – II

Unit I: Market Structure

Meaning, Definition, Classification of Market Structures. Firm & Industry- Meaning, Difference between Industry and Firm. Pricing of Products-Types, Cost-based pricing, Customer-based pricing, Competitor-based pricing.

Unit II: Perfect & Imperfect Competition Markets

Definition, Features, Price-output determination under Perfect Competition Market. Monopoly - Definition, Features, Types, Price determination under Monopoly. Concept of Price Discrimination .Monopolistic Competition- Meaning, Features, Price determination under Monopolistic Competition.

Unit III: Theories of Distribution

Theory of Distribution -Modern Theory of Distribution. Theories of Rent- Ricardian theory of Rent, Modern theory of Rent, Concept of Quasi Rent. Theory of Wages- Marginal Productivity theory of Wages with Criticisms, Nominal & Real wages. Theories of Interest-Loanable Funds Theory of Interest, Liquidity Preference Theory of Interest, Criticisms, Concept of Gross Interest & Net Interest. Theories of Profit- Dynamic Theory of Profit, Innovation Theory of Profit, Criticisms of the Theories, Gross Profit & Net Profit.

Unit IV- Business Cycles & National Income

Business Cycles-Concept, Features, Types, Phases of Business Cycles. National Income - Meaning, Concepts, Methods of Measuring National Income, Difficulties in National Income Accounting.
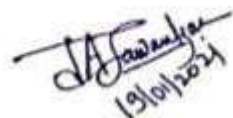
13- Compulsory English

Unit –I Short Stories

1. Some Day by Issac Asimov
2. Marriage is a private affair by Chinua Achebe
3. The Taxi Driver by Kartar Singh Duggal

Unit –II Poems

1. Art of Life by Tukadoji from Gramgeeta (Translation by Dr. Bhelkar)
2. Horses Graze by Gwendolyn Brooks
3. Swan and Shadow by John Hollander

Unit –III   Essays

1. Knowledge and Wisdom by Bertrand Russell
2. On education by Albert Einstein
3. What is Indianness? by Shelia Dhar

Unit –IV

A) a. Degrees of Comparison   b. Words often Confused

B)   Business Correspondence:

   Sales Letter, Inviting Quotations, Placing Orders

C) Comprehension of an Unseen Passage

D) Essay in about 300 words on any one Topics out of the Four Given Topics [Social issues, Economic issues, Environmental issues, Personal (Reflective) essays]

14- Marathi

सत्र दुसरे

प्रश्न क्र.	घटक क्र.	अभ्यासक्रम	गुण	शेरा
१	१	आत्मवृत्तपर, वर्णनपर, विषयांवर आधारित निबंध (चार पर्यायांपैकी एका विषयावर शब्द मर्यादा-४००)	२०	
२	२	गद्य विभाग : पाठ्य पुस्तक : भाषा दर्शन भाग एक १ जेट युगातील मराठी माणूस (शंतनू किर्लोस्कर) २ विठ्ठल तो आला आला (पु. ल. देशपांडे) ३ नवसमाजनिर्मितीचे प्रणेते: महात्मा ज्योतीबा फुले (गंगाधर पानतावणे) ४ भरती (वसंत कन्हाडपांडे) ५ महालूट (सदानंद देशमुख)	३५	
३	३	पद्य विभाग : पाठ्य पुस्तक : भाषा दर्शन भाग एक १ तुकारामांचे अभंग (संत तुकाराम) २ प्रेमाचा गुलकंद (केशव कुमार) ३ पृथ्वीचे प्रेमगीत (कुसुमाग्रज) ४ स्वप्न (येस) ५ दोन कामागारांच्या गोष्टी (लोकनाथ यशवंत)	३५	
४	४	व्यावहारिक मराठी ३. मुलाखत तंत्र ४. म्हणी व वाक्प्रचार	१०	

15- Hindi

इकाई क्रमांक (units)	इकाइयों (units) का पाठ्यक्रम क्रमानुसार	अंक
इकाई 1 (unit-1)	जीवनी, वर्णनात्मक तथा वैज्ञानिक विषयों पर आधारित निबंध। (दिल्ली ख्यात में से एक विषय पर - शब्द सीमा 200 तक)	20
इकाई 2 (unit-2)	गद्य विभाग- पाठ्यपुस्तक- "साहित्य वीथिका" 1) हरिवंश गुलजी के साथ ढाई दिन - संस्मरण- पगोल श्याम जोशी 2) पर्यावरण और हम - निबंध - राजीव गर्ग 3) साइबर कौतुक - एकांकी - मधु धवन 4) राग का रहस्य - संवादी - डॉ. राधाकुमार वर्मा 5) इंस्पेक्टर मातादीन चाँद पर - व्यंग्य - हरिशंकर परसाई	35
इकाई 3 (unit-3)	पद्य विभाग- पाठ्यपुस्तक- "साहित्य वीथिका" 1) टुकरा दो या प्यार करो - घमंडीप्रसाद चौहान 2) कलम और तलवार - रामधारीसिंह दिनकर 3) धूप चमकली है चाँदी की साड़ी पहने - केदारनाथ अग्रवाल 4) भीगे दिन कब आने वाले - हरिवंशराय बच्चन 5) पृथ्वी किसलिए घूमती रही - अरुण कमल	35
इकाई 4 (unit-4)	अन्य पाठ्य सामग्री- 1) मुहावरे और लोकोक्तियाँ - पाठ्यपुस्तक में आगत मुहावरे और लोकोक्तियों का अर्थ एवं वाक्य प्रयोग का अध्ययन अपेक्षित है। 2) पत्र लेखन- पत्र के मुख्य विशेषताएँ शासन, कार्यालयीन पत्र व्यावसायिक ज्ञापन, अर्धशास. आदेश, परिपत्र, अर्धसरकारी पत्र (इसमें आवेदन/नियुक्ति, बीमा, बैंक ज्ञापन, निविदा, वस्तुओं के, क्रय, विक्रय, प्राप्ति एवं सूचना पत्र, आदेश पत्र) इत्यादि सामग्री अध्ययन और अध्यापन के माध्यम से तैयार की जाये।	10

16- Supplementary English

Unit 1- Prose

1. Using the Dictionary- Albert Walker and Mary R. Parkman
2. On the Rule of the Road- A.G. Gardiner
3. How I became a Public Speaker- George Bernard Shaw
4. Seeing People Off- Sir Max Beerbohm
5. The Postmaster- Rabindranath Tagore

Unit 2 - Poetry
1. The Daffodils- William Wordsworth

    2. Stopping by Woods on a Snowy Evening- Robert Frost

Unit 3 Non-Textual Portion

(A) Social Correspondence:
- Letter of Recommendation
- Letter of Introduction
- Making reservations in hotels for accommodation

(B) Note making :
- Serial or sequential format
- Tree diagram

Unit 4 – Grammar

    Spotting errors in the use of- (1) Prepositions s (2) Tenses

Bachelor of Commerce (B.Com) Semester-III

17 – : Financial Accounting – II

Unit – I
Consignment Accounts.

Meaning, Needs, Advantages and Formalities in consignment, Difference between a consignment and a sale, Performa invoice, Account Sales, Accounting Procedure of Consignment, Valuation of Consignment Stock. (**Theory & Numerical**)

Unit – II
Branch Accounts (Excluding Foreign Branch)

Meaning of Branch, Objectives of Branch Accounting, Maintenance of Accounting Records , Transactions relating to Branch. Accounting Procedure of Branch(**Theory & Numerical**))

Unit – III
Flotation of Joint Stock Companies and their Capital Structure.

Types of Shares, Methods of issue of shares, Accounting for Issue, Forfeiture of shares & reissueof forfeited shares (**Theory & Numerical**)

Unit – IV
Final Accounts of Joint Stock Companies

Introduction, Statutory provisions regarding preparation of companies final accounts. Provisionfor interest on debentures, Proposed Dividends, Interim Dividend (**Theory & Numerical**)

18 - Business Communication & Management

Unit – I: Introduction

Meaning, Definition and concept of Communication, Objectives of Communication, Functions of communication Written Communication, Oral Communication, Visual Communication, Audio Visual Communication, interpersonal communication, supervisory communication, grapevine communication, barrier in communication

Unit – II: Business communication

Business communication: concept, objective, elements, purpose, importance, salient feature, principles of effective business communication.
customer care communication In business
Types of business communication-company manual, house journal, placement broacher, leaflets, E MAIL . Public Relations Management- Role of public relations officer inbusiness, group discussion,

Unit-III: **Technology and business communication**

Concept of Management Information System, Role of Computer in communication,

Barriers of computerized Communication –Use of internet, website and electronic media in business communication. **Social media as a mean of communication.**

Unit-IV:

MS-office aided communication: MS Word and its application in business communication , Role of MS-Excel and MS-Power point in communication skill, MS-excel and financial presentation, MS-power point and business communication, Use of MS-power point in business meeting as a tools of effective communication.

19– III: Business Law

Unit-I

(i)   Business law : Meaning, evolution and significance

(ii)   Law relating to Contract – (Indian Contract Act-1872): important definitions, nature and kinds of contract, essentials of a valid contract, offer and acceptance, consideration, capacities of parties to contract, free consent.

(iii)   Void Agreement, Contingent Contract, Quasi Contract

(iv)   Contract of Indemnity and Guarantee, Law of Agency.

Unit-II

(i) Law relating to Sale of Goods- (Sale of Goods Act- 1930): contract of sale of goods, Essentials of a contract of sale, concept of goods, sale distinguished from agreement to sell, difference between conditions and warranties; transfer of ownership and delivery of goods, unpaid seller - his rights against the goods and the buyer.

(ii) Law relating to Partnership- (the Indian partnership act 1932): concept of partnership and partnership firm, types of partner, types of partnership.

(iii) Registration of partnership firm, effect of non registration, partnership deed, duties and liabilities of partners including those of newly admitted partners, dissolution of partnership firms.

Unit-III

(i) Law relating to Negotiable Instruments -(Negotiable Instrument Act-1881): Meaning and Definition of Negotiable instruments, Promissory Notes, Bills of Exchange and its Types, Cheques and Its types, Crossing of Cheques.

(ii) Endorsements: Meaning and Types, Holder and Holder in due course and its rights, Discharge of Negotiable Instruments.

(iii) Parties to a Negotiable Instrument - duties, rights, and liabilities

(iv) Prevention of Money Laundering Act-2002: Objectives, Important Definitions and Salient Features.

Unit-IV

(i) Law relating to Consumer protection in India - (Consumer Protection Act-1986): Definition of Consumer, Importance of Consumer, Problems faced by Consumers, Consumer Protection- Need & Importance, Rights & Responsibilities of Consumer

(ii) Definitions: Complaints, Services, Defects & Deficiency, Relief available to consumer, Procedure to file complaints, ways and means of consumer protection, consumer dispute redresser agencies and procedure followed by redresser agencies.

(iv) Law Relating to Information Technology- (Information Technology Act-2000): Objectives, scope and Important Terms, Digital Signature & Electronic Records, Certifying Authority, Digital Signature Certificates, offense and Penalties.

(iv) Cyber Law: Meaning, Important Definitions, Features, Need and Importance of cyber Law in India

20- MONETARY ECONOMICS-I

Unit I: Money
Evolution, Meaning, Definition, Nature and Functions of Money. Quantity Theory of Money and Criticisms. Paper Currency & Methods of Note Issue- Fixed Fiduciary Method, Proportionate Reserve Method, Minimum Reserve Method.

Unit II: Inflation & Deflation

Inflation- Meaning, Nature, Causes, Effects, Impact of Inflation. Deflation - Meaning, Nature,Causes, Effects, Impact of Deflation. Role of Monetary Policy and Fiscal Policy in controlling Inflation & Deflation.

Unit III: Money Market & Policies

Money Market- Concept of Money Market, Objectives, Importance of Money Market, Instruments of Money Market. Monetary Policy and Fiscal Policy Concept-Meaning, Objectives, Need, Importance, Impact, Recent Changes/Trends.

Unit IV: Public Finance

Concept, Meaning, Importance of Public Finance, Principles of Public Finance, Theory of Maximum Social Advantages & Criticisms. Taxation – Definition, Characteristics& Cannons.Types of Taxation- Proportional, Progressive and Regressive Taxation System .Direct and Indirect Taxes- Merits & Demerits.

<h2 align="center">21- Compulsory English</h2>

Unit –I PROSE ITEMS FROM "BLOSSOMS"

1. The Portrait of a Lady - Khushwant Singh

2. Youth and the Tasks Ahead – Karan Singh

3. The Verger - W.S.Maugham

4. *The Eyes are not Here* - Ruskin Bond

Unit –II POEMS FROM "BLOSSOMS"

1. *Money Madness* – D.H.Lawrence

2. *The Felling of the Banyan Tree* – Dilip Chitre

3. *A River* - A.K.Ramanujan

Unit –III

(A) Comprehension of UnseenPassage

(B) Transformation of Sentences:

a. Affirmative –Negative and vice-versa

b. Interrogative – Assertive and vice-versa

Unit –IV

(A) Business Correspondence:

Claim and Adjustment Letters – Making Claims/Offering Adjustments

(B) Drafting Agenda/Minutes of a Meeting

22- Marathi

प्रश्न क्र.	घटक क्र.	अभ्यासक्रम	गुण	शेरा
१	१	पर्यावरण, आधुनिकज्ञानविज्ञान आणि प्रसार माध्यमे ह्या विषयांवर आधारित निबंध (चार पैकी एक ; शब्द मर्यादा-४००)	२०	
२	२	गद्य विभाग : पाठ्य पुस्तक : भाषा दर्शन भाग दोन १ दुःखांत लेकी येणें (म्हाइंभट) २ माझे दत्तक वडील (चि. वि. जोशी) ३ सांगावा (शंकरराव खरात) ४ शेवटची माती (आनंद यादव) ५ जनसामान्यांच्या प्रबोधनाचं गतिचक्र (बा. ह. कल्याणकर)	३५	
३	३	पद्य विभाग : पाठ्य पुस्तक : भाषा दर्शन भाग दोन १ संतवाणी (चोखामेळा, सेना न्हावी, नरहरी सोनार) २ लटपट लटपट तुझे चालणें (होनाजी बाळा) ३ माझी कन्या (बी.) ४ आभाळाची आम्ही लेकरे (वसंत बापट) ५ इश्यैच (यशवंत मनोहर) ६ जहर खाऊ नका (ज्ञानेश वाकुडकर)	३५	
४	४	व्यावहारिक मराठी १ प्रसारमाध्यमांसाठी वृत्तलेखन २ कल्पना विस्तार	१०	

Off. Principal,
S.S. Maniar College, Nagpur

23- Hindi

Class: B.Com II Year III Sem   Subject: HINDI

Unit	Particulars
	गद्य विभाग
1)	हिम्मत और जिंदगी रामधारी सिंह दिनकर
2)	जीवन की किताब
	अनंत गोपाल शेवड़े
3)	पर्यावरण-प्रदूषण समस्या मनोजगत की
	विवेकी राय
4)	गौरा
	डॉ. रामकुमार वर्मा
5)	प्रतिशोध
	महादेवी वर्मा
	पद्य विभाग
1)	विनय-पत्रिका
	तुलसीदास
2)	मीरा के पद
	मीराबाई
3)	रहीम के दोहे
	रहीम
4)	प्रियप्रवास
	अयोध्यासिंह उपाध्याय हरिऔध

Unit	Particulars	From
	जीवनवृत्त (Bio-Data)	
1)	जीवन-वृत्त का सामान्य परिचय दिजिए ।	
2)	जीवन-वृत्त की परिभाष दिजिए ।	
3)	जीवन-वृत्त की विशेषताँए बताईये ।	
4)	जीवन-वृत्त का एक सामान्य प्रारुप बनाइए ।	
5)	एक काल्पनिक जीवन-वृत्त बनाइए ।	
6)	जीवन-वृत्त के प्रकारो को स्पष्ट किजिए ।	
	1) कालानुक्रमिक रेज्यूम	
	2) क्रियाध्यक रेज्यूम	
	साक्षात्कार (Interview)	
1)	साक्षात्कार की परिभाषा दिजिए ।	
2)	साक्षात्कार के उद्देश्य बताइए ।	
3)	साक्षात्कार के प्रकारो का वर्णन किजिए ।	
4)	साक्षात्कार का महत्व स्पष्ट किजिए ।	
5)	साक्षात्कार के सिध्दांतो का वर्णन ।	
6)	साक्षात्कार की प्रमुख सीमाँए बताइए ।	

24- Supplementary English

Unit 1 – Prose

1. The Thief- Ruskin Bond
2. Three Hermits – Leo Tolstoy
3. The Power of Prayer- A.P.J. Abdul Kalam
4. A Tryst with Destiny- Jawaharlal Nehru

Unit 2 - Poetry

1. Still I Rise- Maya Angelou
2. Ulysses - Alfred, Lord Tennyson
3. Telephone Conversation- Wole Soyinka

Non-Textual Portion-

Unit 3- Writing Skills

A) Report Writing

- Inquiry Report
- Progress Report

(A) Expansion of an

Idea   Unit   4   -

Vocabulary

(A) Business Terminology - Ad Valorem, Authorized Capital, Blue Chip, Benchmark, Credit Rating, Corporation, Debenture, Dividend, Excise Duty, Face Value, Fringe Benefits, Goodwill, Gross Profit, Inventory, Inflation, Joint Venture, Kickback, Lease, Mortgage, Patent, Portfolio,
Running Costs, Surety, Social Security, Voucher

Bachelor of Commerce (B.Com) Semester-IV

25- Financial Accounting –III

Unit – I

Final Accounts of Banking Companies

Meaning of Banking Companies, Functions of Banking, Restrictions for a Banking Company, Provision of the Banking Companies Regulation Act 1949, Preparation of Annual accounts as per Banking Companies Regulation Act 1949 as per amendment by RBI.
(Theory & Numericals)

Unit – II

Final Accounts of General Insurance Companies

Introduction, Types of General Insurance, Important Terms- Reserve for unexpired Risk, Reinsurance Claims, Reinsurance Premium, Commission, Bonus in Reduction of Premium and preparation of final accounts
(Theory & Numericals)

Unit – III

Valuation of Goodwill

Meaning, Characteristics of Goodwill, Factors influencing the value of goodwill, Need for Valuation of goodwill , Valuation of goodwill as per -Average Profit Method, Weighted Average Profit Method, Super Profit Method, Capitalization Method. **(Theory & Numericals)**

Unit – IV

Liquidation of Company.

Meaning, Types of Liquidation, Steps in Voluntary Liquidation, Functions of Liquidator, Liquidators remuneration/Commission. Preparation of Liquidator's Final Statement of Account only. **(Theory & Numericals)**
The Financial year ends on 31st March.

26- Skill   Development

Unit I: Introduction:

Basic of personality, Human growth and behavior, Motivation and morality, Meaning of Skill, types; soft and hard skill, need for developing skill, human skill and behavior, Motivation and morality, skill development and employment

Unit II: Communication skills and Personality Development:

Intra-personal communication and Body Language, Inter-personal Communication and Relationships, Leadership Skills, Team Building and public speaking, Communication in English, Presentation Skills, and Quality required for good public speaker,

Unit III: Techniques in Personality development

Self confidence, Mnemonics, Goal setting, Time Management and effective planning, Stress Management, Meditation and concentration techniques, Self Motivation Self acceptance and Self growth

Unit IV : Entrepreneurial skill development

Skill development of rural industrial sectors - small scale - handloom - agro based industries, rural artisans - handicrafts and sericulture. Meaning of entrepreneurship, types skill required for entrepreneurship

27- Income Tax

Unit I: Introduction of Income Tax

i) Basic Concepts of Income Tax, Meaning & Definition of Assesses, Assessment Year, Previous Year, Gross Total Income, Types of Assesses, Income Exempt from tax, Capital & Revenue Expenditure. Agricultural Income.

Residential Status

ii) Residential Status and its effects on Tax incidence: Residential status of Individual, HUF, Firm & Association of Person, Company, Basic Conditions & Additional Conditions.**(Theory)**

Unit II: Income from Salary

i) Definition of Salary, Allowances, Types of Allowances, Taxable Allowances, Tax Free Allowances, Partly Taxable Allowances,

ii) Perquisites, Types of Perquisites, Taxable Perquisites, Tax Free Perquisites,

iii) Types of Provident Fund, Tax treatment of P.F, E.P.F., Superannuation Fund and Computation of Salary Income/Taxable Salary and tax liability. **(Theory & Numericals)**

Unit II Income from House Property

i)Meaning of Annual Value, Fully exempted income of house property, deemed owner.
ii)Deduction from income from house property, unreleased rent, computation of income from house property. **(Theory & Numericals)**

Unit IV : i) Income Tax Slab Rates, Rebates, Income which do not form part of total Income

ii) Deduction under section 80C, 80CCC, 80CCD, 80D, 80DDB, 80E, 80G, 80GG, 80U

iii) Income from Other Sources

Income specifically included under the head of other sources, specified income, casual income, deduction allowed from the income of other sources, computation of income from other sources**. (Theory & Numericals)**

28- Monetary Economics-II

Unit I: **Commercial Banking**

Evolution, Meaning, Functions of Commercial Banks. Role commercial banks in a developing economy. Process of Credit Creation by Commercial Banks & its Limitations, Investment Policy of Commercial Banks. Non-Performing Assets- Meaning, Criteria and Causes.

Unit II: E-Banking & Core Banking

Meaning, Features, Advantages & Disadvantages of ATM (Automated Teller Machines.) Meaning, Features, Merits and Demerits of Credit cards, Plastic cards, Smart cards, e-purse, Laser cards. EFT (Electron Fund Transfer), ECS (Electronics clearing system).

Unit III: Banks and Customers Relationship and Services

Introduction, Meaning of Customer. Bank & Customer Relationship- Debtor & creditor, Trustee and Beneficiary, Agent and Principal, Bailer and Bailee. Opening, operating and closing of various bank accounts. Demat Account -Advantages, Opening and Operation of Demat Account. Methods of Calculating Interest Rates on deposits and on loans.

Unit : IV Central Bank

Meaning, Objectives, Functions, Role of Central Bank. Credit Control- Meaning, Objectives, Methods : Quantitative- Bank Rate, Open Market Operations, Cash Reserve Ratio(CRR), Statutory Liquidity Ratio(SLR), Repo Rate. Qualitative – Varying margin requirement, Regulation of consumer's credit, Issuing directives, Publicity measure, Moral suasion, Credit rationing and limitations.

29- Compulsory English

Unit –I PROSE ITEMS FROM "BLOSSOMS"

PROSE ITEMS FROM "BLOSSOMS" :
1. *Go! Kiss the World* - Subroto Bagchi
2. *The Gold Frame* - R.K.Laxman
3. *The Cabuliwallah* - Rabindranath Tagore
4. *The Struggle for an Education* - Booker T. Washington

Unit –II POEMS FROM "BLOSSOMS"

POEMS FROM "BLOSSOMS" :
1. *If* – Rudyard Kipling
2. *Stay Calm* - Grenville Kleiser
3. *Ballad of the Landlord* - Langston Hughes

Unit –III

(A) Comprehension of Unseen Passage
(B) Transformation of Sentences:
a. Exclamatory-Assertive and vice-versa
b. Change the Voice

Unit –IV

(A) Business Correspondence:
Credit and Collection Letters – Granting Credit/Refusing Credit, Reminders for payment
(B) Interoffice Memorandum/Office Order

30- Marathi

प्रश्न क्र.	घटक क्र.	अभ्यासक्रम	गुण	शेरा
१	१	साहित्यविषयक निबंध (चार पैकी एक; शब्द मर्यादा- ४००)	२०	
२	२	गद्य विभाग : पाठ्य पुस्तक : भाषा दर्शन भाग दोन १ इंद्रायणीच्या वाळवंटात (श्री. म . माटे) २ मित्र (ना. सी. फडके) ३ माणसांत विरलेला माणूस (दुर्गा भागवत) ४ रामा मैलकुली (व्यंकटेश माडगुळकर) ५ प्रेम (मारोती चित्तमपल्ली) ६ विज्ञान युगात भारत (जयंत नारळीकर)	३५	
३	३	पद्य विभाग : पाठ्य पुस्तक : भाषा दर्शन भाग दोन १ दोन भारुडे (संत एकनाथ) २ विद्यार्थ्यांप्रत (केशवसुत) ३ आई (यशवंत)	३५	
		४ विचार झाला पाहिजे (वसंत आबाजी डहाके) ५ आता आम्ही (वैभव सोनारकर)		
४	४	व्यावहारिक मराठी १ स्मरणिका संपादन २. वाक्प्रचार	१०	

31- Hindi

B.Com IV Semester   SYLLABUS

विषय : हिंदी

इकाई एक
साहित्यिक विषयों, भारतीय त्यौहारों तथा स्वास्थ्य संबन्धी विषयों पर आधारित निबंध ।

इकाई दो
गद्य विभाग
1. लक्ष्मी का स्वागत - एकांकी - उपेंद्र नाथ अश्क
2. अभाव - कहानी - विष्णु प्रभाकर
3. अकेली - कहानी - मन्नू भंडारी
4. घर की तलाश - कहानी - राजेन्द्र यादव
5. लकी - कहानी - ममता कालिया

इकाई तीन
पद्य विभाग
1. गीत फरोश - भवानी प्रसाद मिश्र
2. स्वर्णिम पराग - सुमित्रानंदन पंत
3. धरती स्वर्ग समान - नीरज
4. खोने को पाने आये हो - चतुर्वेदी
5. झांसी की रानी की समाधि पर - सुभद्राकुमारी चौहान

इकाई चार
अन्य पाठ्य सामग्री
1. प्रतिवेदन लेखन
अर्थ एवं परिभाषा, उद्भव और विकास, विशेषताएं, प्रकार एवं तत्व, प्रतिवेदन तैयार करते समय ध्यान रखने वाली बातें ।
2. समाचार लेखन
प्रमुख आयाम एवं प्रारूप तैयार करना, विज्ञान विचार, संसद समाचार, समाचार और संसद, अपराध के समाचार, मृत्यु समाचार, विज्ञापन समाचार आदि ।
समाचार लेखन में आवश्यक बातें- 1. शीर्ष पंक्ति 2. अच्छे समाचार की विशेषताएं, भाषा- शैली, अच्छे संवाददाता की योग्यताएं ।

32- Supplementary English

Unit 1 - Prose
1. The Last Salvation- R.P. Sisodia
2. The Romance of a Busy Broker- O' Henry
3. Playing the English Gentleman- M.K. Gandhi
4. My Financial Career- Stephen Leacock

Unit 2 - Poetry
1. Dulce et Decorum est- Wilfred Owen
2. At the Lahore Karhai- Imtiaz Dharker
3. Leisure- W.H. Davies
Non-Textual Portion-

Unit 3 - Writing Skills
A) Report Writing
☐ Recommendation Report
☐ Situational Report about an event or function
B) Writing a dialogue with minimum 5 exchanges

Unit 4 - Vocabulary
(A) Business Terminology
(Advice Note, Arbitration, Boom, Brand, Buffer, Curriculum Vitae, Capital, Devaluation, Duty, Entrepreneur, Gilt-Edged Stock, Infrastructure, Internal Audit, Ledger, Petty Cash, Raw Data, Scrip, Social Audit, Stock Exchange, Tender, Trademark, Underwrite, Warranty, Wildcat Strike, Write-Off) (Students to give the appropriate business term for the definition/ explanation given)

Bachelor of Commerce (B.Com) Semester-V

33- : Financial Accounting – IV

Unit – I Amalgamation and Absorption of Companies
Introduction, Meaning, Characteristics, Objectives, Methods of purchase Consideration, Accounting Procedure of Amalgamation and Absorption.
(Theory & Numericals)

Unit – II Reconstruction of Companies.
(Internal and External Reconstruction of Companies)
Meaning, Characteristics, Objectives, Difference between Reconstruction and Reorganization, Accounting Procedure of Reorganization and Reconstruction.
(Theory & Numericals)

Unit – III Accounts of Public Utility Companies (Electricity, Gas and Water Supply Companies)
According to Double Accounting System-
Meaning, Main features of Double Accounting system, Objective of Double Accounting System, Difference between Double Accounting System and Single Accounting System, Merits Demerits of Double Accounting System, Preparation of Final Accounts.
(Theory & Numericals)

Unit – IV Valuation of Shares
Meaning, Need of Valuation of Shares, Factors affecting the value of shares, Methods of valuation of shares, Net Assets Method/Intrinsic Value Method, Yield Method.
(Theory & Numericals)
The Financial year ends on 31st March.

34–Cost Accounting

Unit – I Cost Accounting :-
Meaning, Importance, Element of Cost, Cost-Absorption, Allocation of Overheads and Methods of costing, Difference between Cost Accounting and Financial Accounting. Simple Problems on Cost Sheet, Tender and Quotations. **(Theory & Numerical)**

Unit – II Reconciliation of Profit /Loss shown by Cost and Financial Accounts:
Need for reconciliation of profit, reason for the difference between cost accounts and financial accounts, objectives of reconciliation statement, methods of preparation of reconciliation statement. **(Theory & Numericals)**

Unit – III Process Cost Accounting :
Methods of costing, advantages and limitations of process costing, difference between job costing and process costing, Normal loss, Abnormal loss and Abnormal effectives, **(Theory & Numericals)**

Unit –IV Contract Costing:
Features of contract costing, Types of contracts, Elements of contract cost, Nature of contract- completed contract, incomplete contract **(Theory & Numericals)**

35- Management Process

Unit I:- Management and Administration: -

Management concept, levels of management, importance & functions of various levels of management Administration- meaning, concept and functions of administration. Differences between Management and Administration.

Unit II:- Managerial Development & Group Dynamics: -

Need for developing managerial skills, skills required of a manager, classification of managerial skill, methods of developing skills of managers, group dynamics ,meaning & significance, types of groups, group formation development, group composition.

Unit III:- Managerial Style: -

Meaning and types of managerial styles X and Y Theory of Macgregor, factors' influencing managerial style, organization conflict- traditional and modern approaches to conflict, Management as a profession, significance of professional manager in current scenario,

Unit IV:-Motivation:

Definition, Meaning and concept of motivation, kinds of motivation and its importance, Theories of motivation- Maslow's theory of need hierarchy, Herzberg's theory of motivation, relationship between motivation & productivity.

36- Indian Economy – I

Unit I: Indian Economy & Planning

Economic Planning- Characteristics, Rationale, Features, Objectives of Economic Planning. Strategy of India's Development Plans. Objectives and Evaluation of 11th Plan. Objectives of 12th Plan. Resources allocation and financing of five years plans. Regional Planning in India- Aspects of regional planning , Conceptualization, Magnitude &Challenges. Achievements and shortcomings of India's Economics Planning. NITI Aayog-Aims, Objectives & Structure. From Economic Planning to NITI Aayog- Differences in the two Approaches.

Unit II: Indian Economy & Policy

Concept of Economic Growth & Economic Development. Characteristics of underdeveloped/ developing countries. Broad features of Indian economy. Natural resources- Land, soil, water, forest, mineral. Infrastructure - Sources of Energy in India. Power, Coal, Oil and Gas, Atomic, Non-conventional Sources, India's Energy Strategy. Transport System in India- Railways, Road, Water & Air Transport.

Unit III- Population & Unemployment

India's Population: Size and Growth Trends, Causes of Population Explosion, Consequences on Economic Development, Remedies, Population Policy. Employment and Unemployment- Trends, Structure of Employment in India. Nature & Estimates of Unemployment. Urban & Rural Unemployment- Causes, Effect, Government Policy for Removing Unemployment.

Unit IV: India's Public Finance

Public Expenditure-Classification, Role of Public Expenditure in India, Causes of increase in Public Expenditure. Public Revenue-Sources of Public Revenue in India. Public Debt- Meaning, Concept, Classification, Role, Problem and Remedies. India's Fiscal Deficit-Causes, Recent Policy Measures towards Controlling Fiscal Deficit.

37- Computerized Accounting

Unit-I Introduction –

Computerized Accounting, Advantages of Computerized Accounting, Manual Vs Computerized Accounting, Need of Computerized Accounting, Accounts Organization, Accounts group, Loans, Liabilities, Assets and Budget.

Unit-II Accounting Software's

    Introduction to Tally Software, Features of Tally, Tally Screen, Company Information, Creating new Company, Gateway, Selection of Company, Selection of Options, Buttons at Gateway, Working with multiple Companies, Company Features, Configuration – General, Numeric Symbols, Voucher Entry, Invoice Order Entry, Printing.

Unit-III Accounts Info Menu, Account Groups –

    Create new group, creation of Primary group. Normal and Advance Information, Ledger Accounts, Cost Categories, Cost Centers. Creation of Budget, Types of Budget. Voucher – Voucher Entry, Creation of Voucher Screen, Types of Voucher, Selection of Voucher Types, Post Dated Voucher, Printing of Vouchers, Cheque Printing, advance Features of account Voucher.

Unit-IV Inventory Info, Features of Inventory Info. Configure –

    Inventory Info, Balance Sheet, Audit trail, Ratio Analysis. Display – Accounting Report Display, Inventory report Display, and MIS Report Display. Printing Reports, Export of Data. Maintenance – Bank Reconciliation, House Keeping, Data Maintenance. Security – Users and Password, Security Controls, Types of Security, Creation New Security Levels and Tally Audit.

38- Business Finance –

Unit –I   Business Finance-

    Meaning, Nature, Significance, Objects and Scope of Business Finance, Functions of Financial Executive in an Organization.

    Sources of Business Finance-Long- Medium and Short Term Sources of Finance, Equity, Preference shares, Sweat equity shares, Shares with differential rights, debentures & Bonds **.(Theory)**

Unit – II Project Financing:

    Meaning, Steps involved in Project Financing, Appraisal of project, Means of Project finance, Aspect of Project Appraisal. **(Theory)**

    Inventory Management : Need and Cost of Inventory , Economic Order Quantity under constant price and with varying price , Various inventory levels**. (Theory & Numericals) Leverages** -Concept of Leverages, Operating and Financial Leverages. **(Theory & Numericals)**

Unit – III Management of Working Capital.

    Meaning & Concept ,Need or Objects of Working Capital, types, and Advantages of Working Capital , disadvantages of Excessive Working Capital, Determinant's , assessment of Working Capital requirements**(Theory & Numericals)**

Unit – IV Debtors Management.:

    Introduction to Debtors Management, Cost of extending credits, Credit / discount policy, Effective cost of bill discounting . **(Theory & Numericals)**

    Creditors Management: Introduction, Cost of Credit, Accruals / expenses payable as source of finance. **(Theory & Numericals)**

    Venture Capital Financing: Meaning, Methods of Venture Financing, Problem areas facing the Venture Capital Industry. **(Theory)**

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Bachelor of Commerce (B.Com) Semester-VI

39- Financial Accounting- V

Unit-I- Accounts of Holding Company-
Introduction, Meaning of Wholly-owned subsidiary, partly-owned subsidiary, preparation of Consolidated Balance Sheet and Profit and Loss Account,simple problem on involving two companies only.

Unit-II- Insurance Claims
Introduction, Loss of stock Average clause practical problem on loss of stock.

Unit-III- Investment Accounts
Meaning , Need,Utility and objectives, Sales and Purchase of different types of Securities, Simple problem on Investment and Securities.

Unit-IV- Profit prior to incorporation-
Meaning Methods of ascertain the pre-incorporation profit, Issue and Redemption of preference shares Redemption out of new issue of shares Redemption at premium out of new issue of shares, Redemption out of profit.

40-Management Accounting

Unit I Correlation-
Types of correlation, Karl Pearson's coefficient of correlation in Bivariate frequency table, probable error, interpretation of 'r', Rank Correlation Method.

Unit II Regression Analysis-
Lines of Regression/Regressions Equation, Coefficient of regression for a Bivariate

Unit III   Index Number-
Uses of I N, Types of I No. Methods of Index Number.Test of consistency of Index No.- unit test Time Reversed Test, Factor cost of living Index No.

Unit IV Time series Analysis-
Introduction components of a Time series-a) Trend b)Short Term Variation c)Irregular variation d)Measurement of Trend- (Simple Problems)
Graphic Methods ,Methods of Seminar,Methods of Curve by the square Methods of Movig Average frequency table.

41 -Advanced Statistics

Unit I Correlation- Types of correlation, Karl Pearson's coefficient of correlation in Bivariate frequency table, probable error, interpretation of 'r', Rank Correlation Method.

Unit II Regression Analysis- Lines of Regression/Regressions Equation, Coefficient of regression for a Bivariate frequency table.

Unit III Index Number- Uses of I N, Types of I No. Methods of Index Number.Test of consistency of Index No.- unit test Time Reversed Test, Factor cost of living Index No.

Unit IV Time series Analysis-Introduction components of a Time series-a) Trend b) Short Term Variation c)Irregular variation d)Measurement of Trend- (Simple Problems) Graphic Methods ,Methods of Seminar ,Methods of Curve by the square Methods of Moving Average

42- Indian Economy II

Unit I: Indian Agriculture

Nature, Role of Agriculture in Indian Economy. Cropping Pattern in India and its Determining Factors Land Reforms. Cooperative Farming & Marketing. Green Revolution: Impact and Constraints. Cause & Remedies to Low Agricultural Production and Productivity. Agriculture Marketing-Problems & Remedies. Agricultural Labour - Problems & Remedies. Sources of Agriculture Finance. NABARD (National Bank for Agriculture and Rural Development). Financial Inclusion. Agricultural Price Policy- Objectives and Constituents. Agricultural Subsidies in India. Crop & Live Stock Insurance -Problems and Remedies.

Unit II: Indian Industry

Industrial Policy 1991. Small Scale and Cottage Industries- Role, Performance, Problems and Remedies. Public Sector Industries - Role, Performance, Problems and Remedies. Privatization of Public Sector Industries: Meaning, Methods of Privatization Policy in India. Arguments in favor and against privatization. Policy of Disinvestment. Industrial Sickness in India- Definition, Causes, Effects, Remedial Measures. Indian Trade Union Movement: Role, Functions, Strength and Weaknesses

Unit III: Indian Service Sector

Growth of Services Sector in India. Nature, Scope, Trends & Importance of Service Sector in Current Scenario. Share of Service Sector in India's Employment Generation. Contribution of Service Sector to India's GDP. Government's reforms in various Services. IT & ITES Sector-Trend, Role & Importance. Challenges and Opportunity in IT & ITES Sector. Banking & Insurance Sector- Importance of Banking and Insurance Industry in India's Service Sector, Challenges and Opportunities.

Unit IV: India's International Trade

Foreign Trade -Concept and Meaning, Advantages, Disadvantages, Composition and Direction of India's Exports & Imports. Special Economic Zones- Concept, History, Benefits, Arguments against SEZS. Foreign Capital and Aid- Need, Role, Problems. India's External Debt. Multinational Corporations(MNCs)- Role, Importance, Advantages and Disadvantages. Impact of MNCs on Indian Economy. Liberalization, Privatization, Globalization(LPG)- Meaning, Role, Impact of LPG on Indian economy. World Trade Organization (WTO)- Objectives, Working and Functions, WTO & India.

43- Human Resource Management

UNIT-I Introduction

Human Resource Management, Definition, Objectives, Functions, Scope, Importance. Quality of a ideal Human Resource Managers

UNIT-II Recruitment selection and training

Recruitment: - meaning, source; selection process and importance, placement and induction, career planning v/s manpower planning

Training: - meaning, method, training and development,

UNIT-V Labour welfare and Collective bargaining

Labour welfare: - Safety and Health Measures Workers Participation in Management –Objectives for Wage Incentive - Fringe Benefits

Collective Bargaining - Features - Pre-requisite of Collective Bargaining – Agreement at different levels, Successful Participation of workers in Management.

UNIT-IV Human resource planning and accounting

Human Resource Planning - Human Capital Investment - Expenditure vs. Productivity Meaning and Definition of Human Resource Accounting, Importance; Human Resource Accounting - Measurement of Human Value addition into Money Value

44- Business Finance – II

Unit – I   Financial Market in India :

Significance of Financial Markets, Objectives and functions of the financial System, Types of Financial Markets, Money Market- Meaning , features, functions, Composition Capital Market- Meaning ,Composition & Structure of Capital Market Market segment. Products and Participant's in Primary market. Regulatory authorities governing financial and capital market. SEBI - (Security Exchange Board of India)Organisational structure of SEBI, Role and Functions of Stock Exchange and SEBI, Regulation issued by SEBI, Achievements of SEBI.(Theory)

Unit – II Primary Market:

Meaning, Functions, Scope & Significance of PrimaryMarket,Developments in the Primary Market, Primary Market Intermediaries. Secondary Market: Meaning , Difference between Primary Market & Secondary Market, Products dealt in the Secondary Market, Stock Exchange, Secondary Market Intermediaries. Listing Procedure. NSE and BSE. (Theory)
Capital Budgeting - Meaning, Nature and Importance of Capital Budgeting, Investment Appraisal Techniques, Pay Back Period Method, Rate of return method, Net Present Value Method, Discounted Cash Flow Method, (Theory & Numericals)

Unit – III NBFC's-

Meaning, Formation of NBFC's , Types and Regulation of NBFC's, Credit Rating: Meaning /Concept, Scope & Significance of credit rating, Benifits to Investors. Credit Rating Agency in India CRISIL, ICRA, CARE. (Theory) Dividend Policies- Essentials of Sound Dividend Policy, Determination of Dividend Policy and its types ,Surplus and Reserve Policy, (Theory & Numericals)

Unit -IV Cash Flow for Investment Analysis-

Meaning, Benefits and Uses of Cash Flow Statement. Significance ,Limitations of Cash Flow Statement. Format of Cash Flow Statement as per AS-3. (Theory & Numericals)

Bachelor of Commerce Computer Application (BCCA) Semester-I

45- English and Business Communication-I

UNIT I

A. Comprehension of an Unseen Passage
B. Enriching Vocabulary: Synonyms and Antonyms, Single Word for a Group of Words, Change of Word from Noun to Adjective & vice-versa.

UNIT II

Business Correspondence: Application for Employment, Job Offer Letters, Sales letters, Claim and Adjustment Letters

UNIT III

Communication Process: Sender, Channel, Message, Receiver and Response

Types of Communication:

a. According to mode:	a. Oral	b. Written
b. According to Medium:	a. Electronic	b. Print
c. According to number of participants :	a. Dyadic	b. Group
d. According to Direction:	a. One-way	b. Two-way
e. According to Purpose:	a. General	b. Business (Specific)

UNIT IV

Textbook entitled 'Prism: Spoken and Written Communication, Prose & Poetry' published by Orient Black Swan

Prose

i) With the Photographer – Stephen Leacock
ii) Socrates and the Schoolmaster – F. L. Brayne
iii) Speech on Indian Independence – Jawaharlal Nehru

Poetry

i) On Television - Roald Dahl
ii) The Felling of the Banayan Tree - DilipChitre
iii) Stay Calm - Grenville Kleiser

46- Financial Accounting I

UNIT – I Introduction to Financial Accounting: Accounting as an information system, Financial, cost and management Accounting and their interrelationships, Finance Function and Accounting, Accounting as an academic Discipline, Accounting as an Career and Profession, Place of Accounting Officers in the Organization, Auditing and Internal Control, Ethical Issues in Accounting, Forms of Organizations and Their Effect on Accounting, Accounting and Corporate Governance. Accounting Concepts, Standards and IFRS: Introduction ,Accounting Concepts and Convention, Accounting Policies, Generally Accepted Accounting Principles(GAAP), International Financial Reporting Standards(IFRS),Indian Accounting Standards(Ind AS),India's Road map to Convergence with IFRS, Indian Government Accounting Standards(IGAS). Presentation of Financial Statements: Balance Sheet: Conceptual Basis of a Balance Sheet, Capital and Revenue Expenditure and receipts, Classification of Item on a Balance sheet, Format of Balance Sheet, Balance Sheet Equation, Preparing Balance Sheet.

UNIT – II Preparation of final Accounts: The Income Statements: Introduction, Format of Profit and Loss Account, Profit and Loss account of a Manufacturing Concern, Appropriation of Profit, Advantages of Profit and Loss Account. Mechanics of Accounting: Introduction, Classification of Accounts, Double Entry System, Overview of Accounting cycle, Preparing journals, Subsidiary Books, Ledger, Preparation of Trial Balance, Accounting Errors and Their Rectification, Bank Reconciliation statement (BRS), Computerised Accounting. Fixed Assets and Depreciation

Accounting: Introduction, Cost of Fixed Assets, Depreciation, Method of computing depreciation, Accounting Treatments for transactions, Impairment of Assets.

UNIT – III Inventory Valuation: Introduction, Record Keeping for Inventory, Perpetual inventory System, Inventory Valuation/Measurement, Methods of Valuation of Inventories, Analysis of Inventories. Corporate Accounts: Introduction to Companies, Types of Companies, Shares and Share Capital, Issue of Shares. Share Issue: Payments in Installment, Buyback of Shares, Debentures and Bonds, Income Statement/Profit and Loss Account, Balance Sheet, Company Annual Report. Cash Flow Statement: Introduction to Cash Flow Statement, Cash and Cash Equivalents, Cash Flow Activities, Operating Activities, Some Special Items, Free cash Flow, Fund Flow Statement, Analysis of cash Flow Statement, Preparation of cash Flow Statement.

UNIT – IV Financial Statement Analysis: Introduction Techniques for financial Statement Analysis Horizontal Analysis: Comparative and Trend Statements, Vertical Analysis: Common Size, Liquidity Ratios: Current and Quick Ratio, Solvency Ratios: D/E, Interest Coverage, Profitability ratios: (GP,NP,EBIT,EBDITA,EPS), Return Ratios: ROI, ROE, Turnover Ratios, Analysis of Stock and Debtors, Working Capital Management, Stock Prices and Financial Data: P/E. Investments: Introduction, Financial Instruments, Assets and Liabilities, Joint Ventures, Subsidiaries and Associates, Consolidated Financial Statement, Business Combinations, Accounting for Investments, Contemporary Issues in Accounting : Introduction ,Foreign Currency Accounting , Creative Accounting, Forensic Accounting , Environmental Accounting, Lean Accounting ,Human Resource Accounting, Objectives of Human resource Accounting, HRA in India, Inflation Accounting, Responsibility Accounting, Transfer Pricing, Segment reporting, Extensible business Reporting Language(XBRL).

47- Fundamentals of Computers

UNIT – I Understanding the Computer: Introduction, Evolution of computers, Generation of computers, Classification of computers, Computing concepts, The computer system, Application of computers. Computer Organization and Architecture: Introduction, Central processing unit, Internal communications, Machine cycle, The bus, Instruction set. Memory and Storage Systems: Introduction, Memory representation, Random Access Memory, Read Only Memory, Storage systems, Magnetic storage systems, Optical storage systems, Magneto optical system, Solid-state storage devices, storage evaluation criteria.

UNIT – II Input Devices: Introduction, Keyboard, Pointing devices, Scanning devices, Optical recognition devices, Digital camera, Voice recognition system, Data acquisition sensors, Media input devices. Output Devices: Introduction, Display monitors, Printers, Impact printers, Non-impact printers, Plotters, Voice output systems, Projectors, Terminals. Computer Codes: Introduction, Decimal system, Binary system, Hexadecimal system, Octal system, 4-bit Binary Coded Decimal(BCD) Systems, 8-bit BCD Systems, 16-bit Unicode, Conversion of numbers

UNIT – III Computer Software: Introduction, Types of computer software, System management programs, System development programs, standard application programs, Unique application programs, Problem solving, Structuring the logic, Using the computer. Programming Languages: Introduction, History of programming languages, Generations of programming languages, Characteristics of good programming languages, Categorization of High-level languages, Popular High-level languages, Factors affecting the choice of languages, Developing a program, Running

a program. Data Communication and Networks: Introduction, Data communication using modem, Computer network, Network topologies, Network protocol and software, Application of network.

UNIT – IV
Operating Systems: Introduction, History of operating systems, Functions of operating systems, Process management, Memory management, File management, Device management, Security management, Types of Operating systems, providing user interface. Popular operating systems. Microsoft Software: Introduction, MS-DOS, MS Word systems, MS Excel systems ,MS PowerPoint systems, MS Access systems, MS Publisher.

48- Programming in 'C'

UNIT – I Data Types, Operators and some statements: Identifiers and keywords, Constants, C Operators, Type Conversion. Writing a Program in C: Variable declaration, Statements, Simple C Programs, Simple Input Statements, Simple Output Statements, and Features of stdio.h. Control Statements: Conditional Expressions, Loop Statements, Breaking control statements.

UNIT – II Function and Program Structures: Introduction, Defining a Function, Return Statement, Types of Functions, Actual & Formal Arguments, Local & Global Variables, Multifunction Program, and The Scope of Variables, Recursive Function, and ANSI Function Slandered. Arrays: Array Notation, Array Declaration, Array Initialization, Processing with Arrays, Arrays and Functions, Multidimensional Array, Character Array.

UNIT – III Pointers: Pointer Declaration, Pointer Arithmetic, Pointers and Functions, Pointers and Arrays, Pointer and Strings, Array of Pointers, Pointers to Pointers. More on Functions: Pre-processors, Macros, Header Files, standard Functions.

UNIT-IV Structures, unions and Bit Fields: Declaration of Structure, Initializing a Structure, Functions and Structures, Array of Structure, Arrays within Structure, Structure within structure, Pointer and ?Structure, Union, Bit Fields, Typedef Enumerations. Data File Operations: Review of input/output Functions, Opening and Closing of files, Simple File Operation, Structures and File Operation, Block Read/Write, More on File operations, Low level File operations, Random Access File processing.

49- Practical

A1. Draw a flowchart, write an algorithm and program in "C" to check whether the entered character is either alphabet, Digit or Special Character.

A2. Draw a flowchart, write an algorithm and program in "C" to check whether the entered character is in either Uppercase or Lowercase and also convert that character either in Uppercase or Lowercase by using toupper(), tolower(), getchar(), putchar( ), isupper( ) and islower( ) library functions.

A3. Draw a flowchart, write an algorithm and program in "C" to generate the mark sheet of student using following information.
    a. Name of the student.
    b. Roll Number
    c. Course Name
    d. Marks of 5 subjects, each subject carries 100 marks. Passing marks of each subject is 45.
    e. Calculate Total Marks.
    f. Calculate Percentage.
    g. Display the Result, the conditions for result is –
       ➤ Result = "Pass", if the student get 50% aggregate and must not get less than 45 marks in each subject.
       ➤ Else Result = "Fail"
    h. Display the Grade, The grade will be –
       ➤ Grade = "Distinction", If Percentage>=75.
       ➤ Grade = "First Class", If 60 <= Percentage < 75.
       ➤ Grade = "Second Class, If 50 <= Percentage <60.
       ➤ Grade = "Fail", If Percentage < 50.

A4. Draw a flowchart, write an algorithm and program in "C" to generate and print Fibonacci series and check whether each number is prime or unprimed.

A5. Draw a flowchart, write an algorithm and program in "C" to generate and print Fibonacci series and check whether each number is EVEN or ODD.

A6. Draw a flowchart; write an algorithm and program in "C" to convert the total number of days into number of years, months and remaining days. Consider 360 days in a year and 30 days in month.

A7. Draw a flowchart; write an algorithm and program in "C" to perform the following arithmetic operations using arithmetic operators in switch statement. The Arithmetic operations are addition (+), Subtraction (-), Multiplication (*), Integer Division (/) Real Division (/), modulo (%) and Raise to power (^).

A8. Draw a flowchart; write an algorithm and program in "C" to check the entered character is vowel or not using switch statement.

A9. Draw a flowchart; write an algorithm and program in "C" to convert Decimal Number to its equivalent Binary Number.

A10. Draw a flowchart; write an algorithm and program in "C" to convert Binary Number to its equivalent Decimal Number.

A11. Draw a flowchart; write an algorithm and program in "C" to find LCM and HCF of two numbers.

A12. Draw a flowchart, write an algorithm and program in "C" to Print and evaluate the following series. The series is —
$$Sum = (x)+(x^2/2!)+(x^3/3!)+(x^4/4!)+(x^5/5!)+\dots\dots\dots$$

A13. Draw a flowchart, write an algorithm and program in "C" to Print and evaluate the following series. The series is —
$$Sum = (x)+(x^3/3!)+(x^5/5!)+(x^7/7!)+(x^9/9!)+\dots\dots\dots$$

A14. Draw a flowchart, write an algorithm and program in "C" to enter the Nine digit number, find and print even and odd numbers from that nine digit number also find the summation of all even number and odd numbers.

A15. Draw a flowchart, write an algorithm and program in "C" to check the entered number is Palindrome or not also print the reverse of the given number.

A16. Draw a flowchart, write an algorithm and program in "C" to swap the values of two variables with and without using third variable.

A17. Draw a flowchart, write an algorithm and program in "C" to generate and print the Prime Factors of a given number.

A18. Draw a Flowchart; Write an Algorithm and Program in "C" to Calculate the Mean and Variance of 10 Integer Numbers.
Where $\quad$ Mean $= \Sigma(X_i)/N$ and
$\qquad$ Variance $= \Sigma\ (X-\bar{X})^2/N$

A19. Draw a Flowchart; Write an Algorithm and Program in "C" to Find the Largest and smallest number form a single dimension array.

A20. Draw a Flowchart; Write an Algorithm and Program in "C" to Search an Element from a single dimension array with its position using Sequential search Technique. Print the message "Element found at position _____", if the element present in an array and print message "Element Not Found", if element is not present in an array.

A21. Draw a Flowchart; Write an Algorithm and Program in "C" to insert an element in a given position in an array.

A22. Draw a Flowchart; Write an Algorithm and Program in "C" to delete an element from a given position of an array.

A23. Draw a Flowchart; Write an Algorithm and Program in "C" to Sort elements of a given array using Bubble Sort in an ascending order.

A24. Draw a Flowchart; Write an Algorithm and Program in "C" to find the sum of Each Row and each column of a given Matrix and also find the sum of all elements.

A25. Draw a Flowchart; Write an Algorithm and Program in "C" to convert the matrix into Transpose of Matrix also print both the original and Transpose of Matrix.

A26. Draw a Flowchart; Write an Algorithm and Program in "C" to add two matrices of the given range and print all the three matrices.

A27. Draw a Flowchart; Write an Algorithm and Program in "C" to find the product of two matrices of the given range and print all the three matrices.

A28. Draw a Flowchart; Write an Algorithm and Program in "C" to check the entered String is Palindrome or not with and without using String Manipulation Functions.

A29. Draw a Flowchart; Write an Algorithm and Program in "C" to Find the given character and replace that character with new character of the original text also print the modified text.

A30. Draw a Flowchart; Write an Algorithm and Program in "C" to count the number of spaces, alphabets, digits, special symbols from a given text using String Manipulation Functions.

A31. Draw a Flowchart; Write an Algorithm and Program in "C" to count the number of spaces, alphabets, digits, special symbols from a given text using ASCII Characters.

A32. Draw a Flowchart; Write an Algorithm and Program in "C" to count the number of words and all characters excluding spaces from a given text without using string manipulation Functions.

A33. Draw a Flowchart; Write an Algorithm and Program in "C" to concatenate two strings into third string without using string manipulation Functions.

A34. Draw a flowchart, write an algorithm and program in "C" to Design and Print the following Output of any entered string, for example -

```
P
P       R
P       R       I
P       R       I       N
P       R       I       N       T
P       R       I       N
P       R       I
P       R
P
```

A35. Draw a Flowchart; Write an Algorithm and Program in "C" to Append to string arrays in third array.

A36. Draw a Flowchart; Write an Algorithm and Program in "C" to Sort a String array in either Ascending or Descending order.

A37. Draw a Flowchart; Write an Algorithm and Program in "C" to insert an element in an appropriate position in a sorted array. The array is sorted in an ascending order.

A38. Draw a flowchart, write an algorithm and program in "C" to Design and Print the following Output.

```
                1
            2   3   2
        3   4   5   4   3
    4   5   6   7   6   5   4
5   6   7   8   9   8   7   6   5
```

A39. Draw a flowchart, write an algorithm and program in "C" to Design and Print the following Output.

```
                  *
              *   *   *
          *   *   *   *   *
      *   *   *   *   *   *   *
          *   *   *   *   *
              *   *   *
                  *
```

A40. Draw a flowchart, write an algorithm and program in "C" to Design and Print the following Output.

```
1
0   1
0   1   0
1   0   1   0
1   0   1   0   1
0   1   0   1   0   1
```

A41. Write an algorithm, draw a flowchart and develop 'C' program to Create a structure Student containing fields for Roll No., Name, Class, Year and Total Marks. Create 10 students and store them in a file.

A42. Write an algorithm, draw a flowchart and develop 'C' program to create a file "abc.txt" and store the text. Copy the content from "abc.txt" to another file "xyz.txt" using putc() and getc() function. Also read the content of both files.

Bachelor of Commerce Computer Application (BCCA) Semester-II

50- English and Business Communication-I

UNIT-I (A) Comprehension of an Unseen Passage (B) Punctuation, Words often confused

UNIT-II Business Correspondence: Inviting Quotations, Placing Orders, Credit Letters - Granting/Refusing Credit, Letter to Bank for overdraft facility

UNIT-III • Elements of communication • Objectives of communication • Essentials of effective communication • Barriers to effective communication • Suggestions to overcome the barriers

UNIT-IV Textbook entitled _Prism: Spoken and Written Communication, Prose & Poetry' published by Orient Black Swan Prose

i)   An Astrologer's Day – R. K. Narayan
ii)   The Gift of the Magi – O. Henry
iii) The Bet – Anton Chekhov

51- Principles of Business Management

UNIT- I
Nature And Functions Of Management – Importance Of Management, Definition Of Management, Management Function Or The Process Of Management, Levels Of Management, Organizational Or Business Functions, Role Of A Senior Management, Managerial Skills, Managerial Effectiveness, Management And Administration, Management- A Science Or An Art?, Management- A Profession?, Professional Management Vs Family Management, Management Of International Business. **Development Of Management Thought-** Early Classical Approaches, Neo-Classical Approaches, Modern Approaches. **Planning**- Nature Of Planning, Importance Of Planning, Types Of Plans, Steps In Planning, Strategic Planning Process, Limitation Of Planning, Making Planning Effective, Planning Skills, Strategic Planning In The Indian Industry. **Decision Making**- Meaning Of Decision, Types Of Decision, Steps In Relational Decision-Making, Rationality In Decision-Making, Environment Of Decision-Making, Common Difficulties In Decision-Making.

UNIT- II
Organization- What Is An Organization?, Process Of Organizing, Principles Of Organizing, Span Of Management, Departmentalization, Process Departmentalization, Purpose Departmentalization, Organization Structure, What Type Of Structure Is Best?, Emerging Organization Structures, Committees, Teams, International Organization Structures. **Coordination** – Distinction Between Coordination And Cooperation, Distinction Between Coordination And Control, Need For Coordination, Requisites For Excellent Coordination, Types Of Coordination, Techniques Of Coordination, Difficulties Of Coordination, Coordinating Global Operations. **Informal Organization** – Why Do Informal Group Forms?, Types Of Informal Groups, Stages Of Group Development, Distinction Between Formal And Informal Organization, Benefits Of Informal Organization To Its Members, Benefits Of Informal Organization To Its Management, Dysfunctional Effects Of Informal Organization, How To Minimize The Dysfunctional Effects Of Informal Organization?, Group Dynamics. **Staffing**- Importance And Need For Proper Staffing, Manpower Planning, Recruitment, Selection, Placement, Induction, Manpower Planning In India, Staffing From A Global Perspective.

UNIT- III

Training And Development- Difference Between Training, Education And Development, Advantages Of Training, Steps In Setting Up A Training And Development Programme, Design And Development Of The Training Programme, Evaluation Of Training And Development, Executive Training Practices In India, Mentoring, Learning Organization, Knowledge Management. **Performance Management**- Purpose Of Appraisal, Steps In Designing Performance Management System, Criteria And Standards Of Performance Appraisal, Frequency Of Appraisal, Performance Appraisal Methods, Limitations Of Traditional Appraisal Methods, Post-Appraisal Interview, Appraisal Of Management, Performance Management In Indian Industries, Expatriate Performance Appraisal, Career Planning And Development, Appraisal Of Organizational Development. **Compensation Plans**- Classification Of Compensation, Primary Compensation, Monetary Incentive, Non-Monetary Incentive, Recognition As A Reward, Benefits, Wage Packet Of Indian Worker, International Compensation. **Direction And Supervision-** Requirements Of Effective Direction, Giving Orders, Motivation, Job Satisfaction, Organizational Commitment, Morale, First-Level Or Front- Line Supervision.

UNIT- IV

Communication- Importance Of Communication, Purpose Of Communication, Formal Communication, Forms Of Communication, Informal Communication, The Communication Process, Barriers To Communication, Principles Of Effective Communication, Communication Networks, Checks On In-Plant Communication, Communication In Indian Industries. **Leadership** – Difference Between A Leader And A Manager, Characteristics Of Leadership, Functions Of A Leader, Traditional Approaches To Leadership, Situational Factors Determining Choice Of Leadership Style, New Approaches To Leadership, Leadership Assessment, Leadership Style In Indian Organization, Worker Participation In Management In India. **Managerial Control-** Steps In A Control Process, Need For Control System, Benefits Of Control, Essentials Of Effective Control System, Problems Of The Control System, Control Techniques. **Organizational Change**-Need For Planned Change, Managing Organizational Change, Requisites For Successful Planned Chase, Recent Planned Changes In The Corporate Sector In India.

52- Programming in "C++"

UNIT – I

Introduction to Object Oriented Programming: Introduction, What is Object Oriented Programming(OOP)?, Structured Procedural programming(SPP), Object Oriented Programming OOP, Characteristics of OOPs, Advantages of OOPs, Disadvantages of OOPs, Comparison of SPP and OOP, Steps in Developing OOP Programs, Structure of Object Oriented Programs, Object Oriented Languages, Importance of C++. **Data Types, Operators and Expressions:** Identifiers & Keywords, Data Types, C++ Simple Data Types, Literals, Variables, the Const Data type, C++ Operators, Type Conversion. **Input and Output Streams:** Comments, Declaration of Variables, the Main () Function, Simple C++ Programs, Program Termination, Features of IOStream, Keyboard and Screen I/O, Manipulator Functions, Input and Output (I/O) Stream Flags. **Control Statements:** Conditional Expressions, Loop Statements, Nested Control Structures, Breaking Control Statements.

UNIT – II

Function and Program Structures: Introduction, Defining a Function, Return Statement, Types of Functions, Actual & Formal Arguments, Local & Global Variables, Default Arguments, Structure of C++ Program, Order of the Function Declaration, Manually invoked Functions, Nested Functions, Scope Rules, Side Effects, Storage Class Specifiers, Recursive Function, Pre-processors, Header Files, Standard Functions. **Arrays :**Introduction, Array Notation, Array

Declaration, Array Initialization, Processing with Arrays, Arrays and Functions, Multidimensional Array, Character Array. **Pointers and Strings:** Introduction, Pointer Arithmetic, Pointers and Functions, Pointers to Functions, Pointers and Arrays, Array of Pointers, Pointers to Pointers, Pointer and Strings, Deciphering Complex Declarations. **Structures, Unions and Bit Fields:** Introduction, Declaration of Structure, Processing with Structures, Initialization of Structures, Functions and Structures, Array of Structure, Array within a Structure, Nested Structure, Pointer and Structure, Unions, Bit Fields, Typedef, Enumerations.

UNIT – III
Classes and Objects: Introduction, Structures and Classes, Declaration of Class, Member Functions, Defining the Object of a Class, Accessing a Member of Class, Array of Class Objects, Pointer and Classes, Union and Classes, Classes within classes(Nested Class). **Special Member Function:** Introduction, Constructors, Destructors, Inline Member Functions, Static Class Members, Friend Function, Dynamic Memory Allocations, This Pointer, Mutable. **Single and Multiple Inheritance:** Introduction, Single Inheritance, Types of Base Classes, Type of Derivation, Ambiguity in Single Inheritance, Array of Class Objects and Single Inheritance, Multiple Inheritance, Container Classes, Member Access Control.

UNIT-IV
Overloading Functions and Operators: Function Overloading, Operator Overloading, Overloading of Binary Operators, Overloading of Unary Operators. **Polymorphism and Virtual Functions:** Polymorphism, Early Binding, Polymorphism with Pointers, Virtual Functions, Late Binding, Pure Virtual Functions, Abstract Base Classes, Constructors under Inheritance, Destructors under Inheritance, Virtual Destructors, Virtual Base Classes. **Templates and Exception Handling:** Function Template, Class Template, Overloading of Function Template, Exception Handling. **Data File Operations:** Opening and Closing of Files, Stream State Member Functions, Reding/Writing a Character from a File, Binary File Operations, Classes and File Operations, Structure and File Operations, Array of Class Objects and File Operations, Nested Class and File Operations. Random Access File Processing.

53- E-Commerce & Web Designing

UNIT – I
Introduction to Electronic Commerce
Electronic Commerce : The Scope of Electronic Commerce, Definition of Electronic Commerce, Electronic Commerce and the Trade Cycle, Electronic Markets, Electronic Data Interchange, Internet Commerce, e-Commerce in Perspective. **Business Strategy in an Electronic Age: The** Value Chain, Supply Chains, Porter's Value Chain Model, Inter Organizational Value Chains. **Competitive Advantage:** Competitive Strategy, Porter's Model, First Mover Advantage, Sustainable Competitive Advantage, Competitive advantage using e-Commerce. **Business Strategy:** Introduction to Business Strategy, Strategic Implication of IT, Technology, Business Environment, Business Capability, Existing Business Strategy, Strategy Formulation and Implementation Planning, e-Commerce Implementation, e-Commerce Evaluation. **Case Study: e-Commerce in Passenger Air Transport:** Choices, Airline Booking Systems, Competition and customer Loyalty, Web Booking Systems, Competitive Outcomes

UNIT – II
Business to Business Electronic Commerce
Inter Organizational Transactions: Inter Organizational Transactions, the Credit Transaction Trade Cycle, A Variety of Transaction, Pens and Things. **Electronic Markets: Markets**, Electronic Markets, Usage of Electronic Markets, Advantages and Disadvantages of Electronic

Markets, Future of Electronic Markets. **Electronic Data Interchange (EDI):** Introduction to EDI, EDI definition, The Benefits of EDI, EDI Example. **EDI: the Nuts and Bolts :**, EDI technology, EDI Standards, EDI Communications, EDI Implementation, EDI Agreements, EDI Security, Nuts, Bolts and the Tool kit. **EDI and Business :**Organizations that use EDI, EDI Trading Patterns, EDI Transactions, EDI Adoption and EDI Maturity, IOS, EDI an Internet e-Commerce. **Inter Organizational e-Commerce: Inter** Organizational Transaction, Purchasing Online, After Sales Online, e-Commerce in Desk top Facilities Management, Pens and Things and the Web.

UNIT – III
Business to Consumer Electronic Commerce
Consumer Trade Transactions: What you want, when you want it, Internet e-Commerce, The e-Shop, Internet Shopping and the Trade Cycle, Other e-Commerce Technologies, Advantages and Disadvantages of Consumer e-Commerce, Consumer e-Commerce at Pens and Things. **The Elements of e-Commerce :** Elements, e-Visibility, The e-Shop, Online Payments, Delivering the Goods, After Sales Service, Internet e- Commerce Security, A Web Site Evaluation Model. **E-Business: Introduction**, Internet Bookshops, Grocery Supplies, Software Supplies and Support. Electronic Newspapers, Internet Banking, Virtual Auctions, Online Share Dealing, Gambling on the Net, e-Diversity **Introduction to the Internet:** Computer in Business, Networking, Internet, Electronic Mail(E-Mail), Resource Sharing, Gopher, World Wide Web, Usenet, Telnet, Bulletin Board Service, Wide Area Information Service. **Internet Technologies:** Modem, Internet Addressing, Physical Connections, Telephone Lines, Internet Browsers, Internet Explorer, Netscape Navigator. **Introduction to HTML:** Designing a Home Page, History of HTML, HTML Generations, HTML Documents, Anchor Tag, Hyper Links, Sample Html Documents. **Header and Body Sections: Header** Section, Title, Prologue, Links, Colorful Web Page, Comment Lines, Some Sample Html Documents. **Designing the body Section :** Heading Printing, Aligning the Headings, Horizontal Rule, Paragraph
Tab Setting, Image and Pictures, Embedding PNG Format Images.

UNIT – IV
Ordered and Unordered Lists: Lists, Unordered Lists, Headings in a List, Ordered Lists, Nested List. **Table Handling: Table**, Table Creation in HTML, Width of the Table and Cells, Cells Spanning Multiple Rows/Columns, Coloring Cells, Columns Specification, Some Sample Tables. **Dhtml and Style Sheets:** Defining Styles, Elements of Styles, Linking a Styles Sheet to an HTML Document, In-Line Styles, External Styles Sheets, Multiple Styles. **Frames:** Frameset Definition, Frame Definition, Nested Framesets. **A web Page Design Project:** Frameset Definition, Animals, Birds, Fish. **Forms: Action** Attribute, Method Attribute, Enctype Attribute, Drop Down List, Sample Forms

54- Practical

1. Write an algorithm, draw a flowchart and develop a C++ program to print the sum and product of digits of an integer.

2. Write an algorithm, draw a flowchart and develop a C++ program to reverse of a number.

3. Write an algorithm, draw a flowchart and develop a C++ program to compute the sum of the first n terms of the following series - $S = 1+1/2+1/3+1/4+\ldots\ldots$

4. Write an algorithm, draw a flowchart and develop a C++ program to compute the sum of the first n terms of the following series - $S = 1-2+3-4+5\ldots\ldots\ldots\ldots\ldots$

5. Write an algorithm, draw a flowchart and develop a C++ function that checks whether a given string is Palindrome or not. Use this function to find whether the string entered by user is Palindrome or not.

6. Write an algorithm, draw a flowchart and develop a C++ program to print a triangle of stars as follows (take number of lines from user):

```
*
***
*****
*******
*********
```

7. Write an algorithm, draw a flowchart and develop a C++ program to swaps two numbers using pointers.

8. Write an algorithm, draw a flowchart and develop a C++ function to find whether a given no. is prime or not. Use the same to generate the prime numbers less than 100.

9. Write an algorithm, draw a flowchart and develop a C++ program to compute the factors of a given number.

10. Write an algorithm, draw a flowchart and develop a C++ program which takes the radius of a circle as input from the user, passes it to another function that computes the area and the circumference of the circle and displays the value of area and circumference from the main() function.

11. Write an algorithm, draw a flowchart and develop a C++ program to demonstrate the use of single inheritance.

12. Write an algorithm, draw a flowchart and develop a C++ program to find largest among two value using friend function.

13. Write an algorithm, draw a flowchart and develop a C++ program in which a function is passed address of two variables and then alter its contents.

14. Write an algorithm, draw a flowchart and develop a C++ program to display Fibonacci series (i)using recursion, (ii) using iteration

15. Write an algorithm, draw a flowchart and develop a C++ program to calculate Factorial of a number (i)using recursion, (ii) using iteration

Practical List of E-Commerce & Web Designing

1. Write a program in HTML to link two files. The name of the first file is LINK1.HTML and that of second file is LINK2.HTML. LINK2.HTML should contain a Back link also.

2. Write a program in HTML to design a table containing 5 columns and 4 rows. The name of the columns should be ENO, NAME, DESIGNATION, SALARY and CITY. Illustrate the usage of cell padding and cell spacing. Also align the Table to the CENTRE of the page.

3. Write a program in HTML to design a Table containing 5 columns and 4 rows. The name of the columns should be ENO, NAME, DESIGNATION, SALARY and CITY. The table should also contain the below given specifications.
   a. Table should contain BORDER.
   b. Background color of the Table should be GREEN.
   c. Color of the Text should be BLUE.
   d. Text should be centrally aligned in the cell.

4. Write a program in HTML to illustrate the usage of ROWSPAN in the below given format.

CITY	TOWN
NAGPUR	SHANKAR NAGAR
	DHARAMPETH
	RAMDASPETH
BOMBAY	DADAR
	V.T.
	THANE

5. Write a program in HTML to illustrate the usage of COLUMN SPAN (COLSPAN) in the below given format.

NAME	LIVING CITY	COMPANY CITY
SUJEET	CHHINDWARA	
TAPAN	NAGPUR	BOMBAY
RAM	BOMBAY	
MOHAN	BANGALORE	
KRISHNA	PUNE	
MANGESH	BOMBAY	NAGPUR
AVINASH	DELHI	

6. Write a program in HTML to divide the Screen into 4 sections.

7. Write a program in HTML to divide the screen horizontally into two sections.

8. Write a program in HTML to demonstrate the usage of Marquee text with the below given Specifications.
   a. Marquee text is INTERNATIONAL COLLEGE.
   b. Color of text is BLUE.
   c. Background color is YELLOW.
   d. Size of Text is 7.
   e. Direction is LEFT to RIGHT.

9. Write a program in HTML to demonstrate the usage of Image file with the below given specification.
   1. Background color of page is GREEN.
   2. The size of Image is 400 x 400 pixels.
   3. The Image should contain a border.
   4. Alternate text is "IMAGE NOT FOUND".
   5. Image should appear on the centre of the page.

10. Write a program in HTML to demonstrate the usage of Image file with the below given specifications.
    1. Background color is RED.
    2. The size of Image is 300 x 300 pixels.
    3. The image should contain a BORDER.
    4. Alternate Text is "IMAGE is NOT FOUND".
    5. Vertical space should be 100 pixels.
    6. Horizontal space should be 350 pixels.

11. Write a program in HTML to illustrate Ordered & Unordered Listing in the below given format.
    1. NAGPUR
       - SHANKAR NAGAR
       - DHARAMPETH
       - SADAR
       - RAMDASPETH
    2. BOMBAY
       - DADAR
       - V.T.
       - THANE

    3. BANGALORE
       - ULSOOR
       - SHIVAJI NAGAR
       - MAJESTIC
       - HAL
       - NAL

    1. Write HTML code to display the following :

Industry Segment	Share of Industry RND	
	1981	1988
Information	32%	42%
Drug	07	09
Combined	39	51

12. Write a program in HTML to illustrate the below given formats.
    1. The page should contain a paragraph which is centrally aligned.
    2. FIRST line of the paragraph should be BOLD and ITALIC.
    3. STRIKEOUT the Second Line.
    4. Underline and change the color to RED, of the third line.
    5. Change the font size of the fourth Line to 5.
    6. Change the color of the text to GREEN.
    7. Two horizontal lines below the paragraph.

13. Write a program in HTML to design a table containing 5 columns and 4 rows. The name of the columns should be ENO, NAME, DESIGNATION, SALARY and CITY.

14. Write a program in HTML to design a Table containing 5 columns and 4 rows. The name of the columns should be ENO, NAME, DESIGNATION, SALARY and CITY. The table should also contain the below given specifications.
    a. Table should contain BORDER.
    b. Background color of the Table should be GREEN.
    c. Color of the Text should be BLUE.
    d. Text should be centrally aligned in the cell.

15. Write a program in HTML to divide the screen horizontally into two sections.

16. Write a program in HTML to demonstrate the use of the Marquee Text with the below given Specifications.
    a. Marquee Text is INTERNATIONAL COLLEGE.
    b. Text color is BLUE.
    c. Repeat the Marquee Text five Times.
    d. Make use of SCROLLAMOUNT.
    e. Make use of SCROLLDELAY.

17. a) Give the advantages of style sheets.
    b) Design a web page to embed external style sheet in HTML document.

18. a) What are the different formats of video file? Explain the various methods to add video file in a web page.
    b) Design a web page to show the use of audio file using different approaches and attributes of embed tag.

19. a. What is CSS? Explain different ways to associate CSS to HTML documents.
    a. Design a web page to embed style sheet in HTML document through <HEAD> tag.

Bachelor of Commerce Computer Application (BCCA) Semester-III

55-Environmental Studies

UNIT - I
Multidisciplinary Nature of Environmental Studies- Environment, Environment Studies, Need for public Awareness, Environmental Degradation, Shelter Security, Economic Security, Social Security, Effects of Housing on Environment , Effects of Industry on Environment**. Natural Resources-** Introduction, Types of Natural Resource, Forest Resources, Water Resources, mineral Resources, Food Security Resources, Energy resources, Land Resources, Conservation of Natural Resources, Sustainable Lifestyles, Sustainable Water Management(SWM), Biogeochemical Cycle.

UNIT – II
Ecosystem- Introduction to Ecology and Ecological Succession, Ecosystem, Food Chain, Ecological Pyramids, Types of Ecosystems, Forest Ecosystems, Aquatic Ecosystems, Grassland Ecosystem, Desert Ecosystem. **Biodiversity and its Conservation-**Biodiversity, Values or Benefits of Biodiversity, Bio geographic Zones of India, Hot Spots of Biodiversity, Endangered and Endemic Species, Rare and Threatened Species, Threats to Biodiversity, Human –Wildlife Conflicts, Conservation of Biodiversity.

UNIT – III
Environmental Pollution and Its Effects- Introduction ,Requirements of a Non polluted Environment, Public Health Aspects, Air Pollution, Land Pollution, Land Pollution or Soil Pollution, Marine Pollution, Noise Pollution, Thermal Pollution, Hazardous Wastes, Nuclear Hazards (Radiation Pollution),Solid Waste and Its Management, Role of Individuals in Pollution Prevention, Disaster Management.

UNIT – IV
Social Issues and the Environment- Introduction, Sustainable Development, Urbanization, Water Conservation, Resettlement and Rehabilitation of People ; Its Problems and Concerns, Social Issues and The Environment, Wasteland Reclamation, ACTs for Environmental Protection, Carbon Credits, Industrial Symbiosis, Initiatives and Roles of Nongovernmental Organization (NGOs) in Environmental Protection, Issues Involved in Enforcement of Environmental Legislation ,Animal Husbandry. **Human population and the Environment-** Population Growth, Family Welfare Programs, Environment and Human Health, Fundamental Rights, Human Rights, Value Education, HIV/AIDS, Environmental Education, Women's Education, Role of Information Technology in Environment and Human Health.

56-Business-Economics

UNIT – I
Introduction: Economics And Business Economics - Introduction, What Is Economics, Definitions, Nature And Scope Of Business Economics, Some Economics Concepts Applied In Business Analysis. **The Economy, Its Basic Problems And Price Mechanism :-** Introduction, What Is An Economy?, How A Free Enterprise Economy Works, Kinds Of Economic Systems, Production Possibilities Of An Economy, Basic Problems Of An Economy, How Market Mechanism Solves The Basic Problems, All Is Not Well With Free Enterprise Economies, Role Of The Government In The Economy. **Laws Of Demand And Supply And Market Equilibrium** :- Introduction, The Concept Of Market, Demand Side Of The Market, Supply Side Of Market, Market Equilibrium, Stability Of Market Equilibrium.

Theory of Consumer Demand: Analysis Of Individual Demand - Introduction, Meaning Of Individual Demand, Utility- The Basis Of Consumer Demand, Cardinal Approach To Consumer

Demand, Ordinal Utility Approach To Consumer Demand –The Indifference Curve Approach, Comparison Of Cardinal And Ordinal Utility Approaches, Revealed Preference Theory, Consumer Surplus. **Elasticity Of Demand** :- Introduction, Meaning Of Demand Elasticity, Price Elasticity Of Demand, Cross-Elasticity Of Demand, Income-Elasticity Of Demand, Advertisement Elasticity Of Demand, Price Expectation-Elasticity Of Demand, Some Estimates Of Demand Elasticity. **Demand Forecasting: -**Introduction, Meaning And Purpose Of Demand Forecasting, Prerequisites Of Good Demand Forecasting, Methods Of Forecasting Demand, Concluding Remarks, Some Case Studies Of Demand Forecasting.

UNIT – II

Production And Cost Analysis: Theory Of Production - Introduction, Some Basic Concepts, Production Function, Laws Of Production-Meaning And Kinds, Short-Run Laws Of Production, Long-Term Laws Of Production-I:Tools Of Analysis, Long-Term Laws Of Production-II: Laws Of Return To Scale, Laws Of Returns To Scale Through Production Function. **Theory of Cost** - Introduction, Cost Concepts, Cost Function, Short-Run Cost-Output Relations, Long-Run Cost Output Relations, Economics And Diseconomies Of Scale, Modern Theory Of Cost. **Market Structure And The Firm's Objectives -** Introduction, Market Structure And Degree Of Competition, Market Structure And Pricing Decisions, The Firm And The Industry, Profit: Meaning And Concepts, Objectives Of Business Firms, A Reasonable Profit Target: A Pragmatic Approach, Profit As Control Measure. **Price And Output Determination Under Perfect Competition -** Introduction, What Is Perfect Competition? Features Of Perfect Competition, Price Determination Under Perfect Competition, Equilibrium Of The Firm In Short-Run, Derivation Of Supply Curve, Equilibrium Of Industry And Firm In Short-Run, Equilibrium Of The Firm And Industry In Long-Run, Long-Run Supply Curve Of The Industry.

UNIT – III

Pricing Decisions Under Monopoly - Introduction, Definition And Features Of Monopoly, Sources And Kinds Of Monopolies, Revenue Curves Under Monopoly, Price And Output Determination In Short-Run, Two Common Misconceptions About Monopoly, There Is No Supply Curve In Short-Run, Monopoly Equilibrium In The Long-Run, Capacity Utilization Under Monopoly, Equilibrium Of Multiplant Monopoly, Price Discrimination Under Monopoly, Monopoly *Vs*. Perfect Competition, Application Of Monopoly Theory, Measures Of Monopoly Power, Government Regulation Of Monopoly Prices. **Pricing Decision Under Monopolistic Competition -** Introduction, Monopolistic Competition: Definition & Characteristics, Basic Elements Of Monopolistic Competition, Firms Equilibrium Under Monopolistic Competition, Excess Capacity Under Monopolistic Competition, Selling Cost And The Firm's Equilibrium: Non-Price Competition, Monopolistic Competition *Vs* Perfect Competition: A Comparison, Drawbacks Of Chamberlin's Theory Of Monopolistic Competition. **Pricing Decisions Under Oligopoly-**Introduction, Oligopoly: A Market Of Few Sellers, The Oligopoly Models: An   Overview, A Classical Model Of Duopoly: Cournet's Model, Chamberlin's Model Of Oligopoly : The Small Group Model, Sweezy's Kinked-Demand Curve Model, Price And Output Determination In Collusive Oligopoly, Baumol's Theory Of Sales Maximization, Oligopoly And The Game Theory.

UNIT – IV

Factor Market: Factor Demand And Supply -Introduction, Marginal Productivity Of Factor And Factor Demand, The Factor Supply: An Overview, Derivation Of Individual Labor Supply Curve,

Derivation Of Market Labor Supply Curve. **Theory Of Wage Determination -** Introduction, Wage Determination Under Perfect Competition, Wage Differentials, Wage Determination Under Product Monopoly And Competitive Labor Market. **Theory Of Rent, Quasi-Rent And Economic Rent -**Introduction, Ricardian Theory Of Rent, Quasi-Rent: The Short-Term Rent On Fixed

Factors, Factor Price, Transfer Earning And Economic Rent. **Theory Of Interest -**Introduction, Meaning Of Interest And Interest Rate, The Classical Theories Of Interest, The Loanable Fund Theory Of Interest, Keynesian Theory Of Interest. **Theory Of Profit -**Introduction, The Meaning Of Profit And Pure Profit, Accounting Profit *Vs* Economic Profit, Theories Of Profit, Does Profit Enter The Cost Of Production?.

57- Visual Basic Programming

Unit – I

Introduction to Visual Basic– Advantages Of Visual Basic, Hardware Requirement, Software Requirement, Installing Visual Basic, Starting Visual Basic, Exiting From Visual Basic. **Working With Visual Basic Window Components**– Menu Bar, Standard Toolbar, Project Explorer Window, Form Layout Window, Properties Window, Toolbox, Code Editor Window, Object Browser, Customizing The Application Development Environment, Editor Tab, Editor Format Tab, General Tab, Docking Tab, Environment Tab, Advance Tab. **Working With Forms**– Extension & With Function Of The File, Properties, Events And Method Of The Form. **Using The Controls Of Visual Basic –** Using Label Control, Using Command button Control, Using Textbox Control, Using Option Button Control, Using Frame Control, Using Checkbox Control, Using Listbox Control, Using Combo box Control, Using Image Control, Using Scroll Control, Using Picture Control, Using Timer Control, Using Drivelistbox Control, Using Dirlistbox, Using File listbox Control, Using The Shape Control. **Basic Programming Fundamentals –** Scope of Variables, Arrays, Operators, Decision Structure, Loop Structure.

Unit – II

Working With Procedure, Functions and Modules – Procedure, Functions, Modules **Accessing Files –** Sequential Method, Random Method, Binary Method. **Menus –** Creating Menus, Creating Popup. **Working With Common Dialog Control –** Showopen, Showsave, Showprint, Showfont, Showcolor, Showhelp. **Control Arrays**– What Is Control Arrays?, Creating Control Arrays Using The First Method, ControlArrays Using The Second Method, Control Arrays Using The Third Method, **Use Of Load And Unload Statement. Working With Custom Controls –** Imagelist Control, Image combo Control, Treeview Control, Listview Control, Sorting List items, Toolbar Control, Statusbar Control.

Unit – III

Creating Mdi Applications – Features Of Child Form, Arrange in Windows, Window List **Creating an Application** – Making An Exe File, Taking Printouts. **Database Handling** – Creating the Database, Accessing the Database By Using The Data Control, Using Ado Data Control. **Working With Advance Data Controls** – Datalist Control, Datacombo Control, Datagrid Controls, Setting the Properties of the Datagrid Control, Msflexgrid Control, Setting the Properties of Msflexgrid Control, Sorting A Column, Merging Cells, Description Of Merge Options, Using The Data Form Wizard, Working With Ms Chart Layout. **Working with SQL Statement** – Displaying All Fields, Displaying Selected Fields, Modifying the Data, Creating Search Program, Creating Numeric Search Programs, Creating Complex Search Program.

Unit – IV

Debugging Techniques – Syntax Errors, Logical Errors, Run-Time Error, Debug Toolbar, Assert Method, Debugging Mode, Step Into, Step Out, Run To Cursor, Set Next, Show Next, Locals Window, Immediate Window, Watch Window, Edit Watch, Deleting Watch Expression, Quick Watch, Call Stack. **Handling Errors**– How Run-Time Error Occurs?, Trapping Error, Handling Errors, Resuming Program Execution, Resume, Resume Next, Using Resume Next, Err Object,

Properties, Methods. **Working With Data Environment and Data Report**– SQL Query Builder, Data Report, Use of Controls, Using the Function Control, Using the Page Footer. **Working With Com Components –** What Is COM?, Introduction, ActiveX Controls, Using The ActiveX Control, Creating The ActiveX Control, Using The ActiveX Control In The Standard EXE, ActiveX Documents, Benefits, Creating An ActiveX Documents, Lifetime Events Of An ActiveX Documents, Describing About Hyperlink Object, Property bag Object, Write Property, Read Property, Property Change Method, Inserting Menus, ActiveX Document Migration Wizard, ActiveX Code Components, Setting Project Properties.

58-Database Management System

UNIT – I
Introduction: Concept of the System, Types of Decisions, Information System, Classification of information System, Conventional File Processing System, Database System, Components of Database Management System, Economic Justification of Database Approach. **Database Concepts:** Introduction, Data, Information, Metadata, Terminologies of Files, Association between Fields, Association between Files (Record Types), File Organization. **Data Structure:** Introduction, Location Methods, Types of Pointer, Inter record Data Structure.

UNIT – II
Data Models: Introduction, Classification of Data Model, Entity Relationship Model. **Database Design:** Introduction, Steps of Database Design, Normalization, Case Problem, Data Volume and Usage Analysis, Integrated Case Study-Database Design for Academic institution. **Implementation Design:** Introduction, Implementation Design, Guidelines for mapping Conceptual data model into a desired logical Data Model, Problem Design Guidelines.

UNIT – III
Structured Query Language - I: Table fundamentals, viewing data in the tables, Eliminating duplicate rows when using a select statements, sorting data in a table, creating a table from a table, inserting data into a table from another table, delete operations, updating the contents of a table, modifying the structure of tables, renaming tables, truncating tables, destroying tables, creating synonyms.

UNIT-IV
Structured Query Language - II: Data Constraints, Types of data constraints, defining different constraints on a table, computations done on table data, ORACLE functions, Date conversion functions, Data functions, Miscellaneous functions, Grouping data from tables in SQL, Subqueries, Joins, concatenating data from table columns, using the UNIONS, INTERSECT and MINUS clause.

59-Practical

Practical List of Visual Basic Programming

B1. Draw a Flowchart. Write an Algorithm and Program to calculate the bonus for the Employee using user defined data types. If grade is A then bonus will be 1000, if B bonus 7000, if C bonus 5000, otherwise no bonus will be given. If the users have to reuse the program then all the values should be cleared and the cursor should be set to the first control. (Note - Use option button & frames)

B2. Draw a Flowchart. Write an Algorithm and Program to give options of Font size, Font color and Font face in the check boxes. Convert the text in the text box by applying the selected fonts.

B3. Draw a Flowchart. Write an Algorithm and Program to increase & decrease the width of command button and to change the position of command button (top & left) on the form using scrollbar.

B4. Draw a Flowchart. Write an Algorithm and Program to generate a thermometer using vertical scrollbar.

B5. Draw a Flowchart. Write an Algorithm and Program to accept an employee_no, emp_name from the user. Display several cities in the list box in which your company have the branches. Allow the user to do the following.

a. User should add the city if new branch opens.

b. Display the selected city.

c. Remove the city if the branch closed.

d. Create another list box in which user can add the metropolitan cities.

Note: Multiple cities can be added from the available cities.

B6. Draw a Flowchart. Write an Algorithm and Program to find the reverse of a 4 digit number and print the sum of all the digits.

B7. Draw a Flowchart. Write an Algorithm and Program to enter a base number and an exponent number from the user. Calculate exponential value of an entered base number.

(For Example, if base = 2and the exponent = 5 then the value will be 32)

B8. Draw the Flowchart. Write an Algorithm and Program to ask a Password while opening a project. Validate the user's password for 3 times, else do not allow the user to open the project.

B9. Draw a Flowchart. Write an Algorithm and Program to generate a stopwatch of 10 minutes using timer control.

B10. Draw a Flowchart. Write an Algorithm and Program to calculate the age of the user in year, month and days as on the current date.

B11. Draw a Flowchart. Write an Algorithm and Program to match the given pairs.

1. Sachin Tendulkar   a. Boxing
2. VishwanathAnand   b. Tennis
3. Leander Pace   c. Chess
4. MikeTyson   d. Cricket

B12. Draw a Flowchart. Write an Algorithm and Program to conduct a competitive examination. The examination contains 5 questions and each question is having 4 option. Assign 10 marks for every appropriate answer & 0 for wrong. Display the total marks at the end.

B13. Draw a Flowchart. Write an Algorithm and Program to add and subtract two different matrices.

B14. Draw a Flowchart. Write an Algorithm and Program to prepare a calculator. The calculator includes following operations - addition, subtraction, multiplication, division.

B15. Draw a Flowchart. Write an Algorithm and Program to calculate the area of a triangle and the area of circle.

Area of Triangle = 1/2 x Base x Height

Area of Circle = Pi x Radius x Radius

B16. Draw a Flowchart. Write an Algorithm and Program to enter the temperature in degree & convert it into Fahrenheit and vice versa.

Celsius = (F - 32) x (5 / 9)

Fahrenheit = (C + 32) x (9 / 5)

B17. Draw a Flowchart. Write an Algorithm and Program to calculate the average of five numbers using focus event.

B18. Draw a Flowchart. Write an Algorithm and Program to input text from the user & change it to Upper case and Lower case using option buttons.

B19. Draw a Flowchart. Write an Algorithm and Program to generate an Electricity Bill. Input customer number, customer name, current reading, last reading and area from the user. Are should be any one from the following –

I. Household   II. Industrial   III. Non Household
IV. Urban   V. Rural   VI. Agriculture
VII. Poultry Farm

Rates for Household :	Rates for Industrial :
1 to 30 - Rs.1 31 to 100 - Rs. 2.55 101 to 300 - Rs.2.95 301 and above - Rs. 4.55	1 to 1000 - Rs.2.40 1001 to 15000 - Rs. 3 15001 and above - Rs. 3.40
Rates for Non Household : 1 to 100 - Rs.2.50 201 and above - Rs. 5	Rates for Urban : For all - Rs. 2.25
Rates for Rural : For all - Rs. 1.40	Rates for Agriculture : For all - Rs. 1.90

B20. Draw a Flowchart. Write an Algorithm and Program to input ASCII values from the user & classify them into Small letters, Capital letters, Numeric value & special characters.

B21. Draw a Flowchart; write an Algorithm and Program to generate a Telephone Bill. Input customer number, customer name, telephone number, current reading, last reading, the month of billing and area as Urban OR Rural from the user. Calculate the bill as follows –

        Call rates for Urban area :-
                Free Calls - 150
                151 to 400 - 0.80 Rs.
                401 to 1000 - Rs. 1
                1001 and above - Rs. 1.20
        Call rates for Rural area:-
                Free Calls - 250
                251 to 450 - 0.60 Rs.
                451 to 500 - Rs. 0.80
                501 to 1000 - Rs. 1
                1001 and above - Rs. 1.20

B22. Draw a Flowchart. write an Algorithm and Program to sort a Numeric Array using Linear Sort method.

B23. Draw a Flowchart. Write an Algorithm and Program to sort a String Array using Bubble Sort.

Practical List of Database Management System

1. Write a SQL Query to create a table"employee":

Field Name	Datatype	Size
Emp_no	varchar2	5
Emp_name	varchar2	25
Address	varchar2	50
Phone_number	number	10
Designation	varchar2	15
Salary	number	15

1. Display the structure of table.
2. Add qualification field at the end of employee table.
3. Modify the size of the name field 25 to 30.

4. Display the employee name whose salary is greater than 20,000.
5. Display the employee details whose name starts with "A".

2. Write a SQL Query to create a table "student":

Field Name	Datatype	Size	Constraint
Roll	number	5	
Name	varchar2	30	
Address	varchar2	30	
City	varchar2	30	
DOB	date		
Phone	number	11	
Class	varchar2	10	
Marks	number	(10, 2)	

1. Display the structure of database and insert 10 records.
2. Display student information for all student in city Pune and Nagpur.
3. Display student information where marks greater than 80 and less than 90.
4. Display student name where first two character of student name 'An'.
5. Change student name to Ashish where student roll number A001.

3. Write a SQL Query to create a table "sales_details":

Field Name	Datatype	Size
S_id	varchar2	8
P_id	varchar2	8
P_name	varchar2	15
Price	number	10
Qty	number	8

1. Drop foreign key constraint on column p_no in table sales_details.
2. Add foreign key constraint on column sale_no in table sales_details.
3. Modify the column qty to include not null constraint.
4. Insert 10 records in sale_details.
5. Display p_id and total of quantity qty for each product.
6. Display p_id and total of price for all the products.

4. Write a SQL Query to create a table "customer":

FieldName	Datatype	Size
Cust_no	varchar2	10
Cust_name	usertype	
Address	varchar2	10
Salary	number	10

1. Modify address field with not null.
2. Add city field as it must keep city name Mumbai, Delhi and Kolkata.
3. Add salary field where salary greater than 20,000.
4. Display the structure of table customer.
5. Insert 10 records into the table customer.
6. Display all the customer details who lives in Mumbai and Kolkata.
7. Display all the customer records whose salary>20,000 and salary<30,000.
8. Modify the address field where customer number is 'C001'.

5. Write a SQL query to create c_master with fieldsc_no, name, address, city, state and pin_code:

Field Name	Datatype	Size
C_no	varchar2	10
Name	varchar2	10
Address	varchar2	10
State	varchar2	20
City	varchar2	20
Pin_code	number	10

1. Create sequence which will generate number from 1..999 in ascending order, with an interval of 1 and in cyclic order.
2. Insert 10 records.
3. Create index on c_master which column name c_no and state.
4. Create view on c_master .
5. Select columns c_no, city which belongs to Nagpur and Mumbai.

6. Write a SQL query to create a syntax seq_order which generating numbers from 1...9999 in   ascending will number with an interval of 1 in cyclic order.

Field Name	Datatype	Size
P_no	varchar2	10
P_name	varchar2	20
Qty	varchar2	10
P_rate	varchar2	10

1. Display next value of sequence seq_order.
2. Display current value of sequence seq_order.
3. Insert values in sal_order table must be generated using sal_order sequence.
4. Display all records of sal_order table.
5. Change a cache memory of 50 seq_order sequence having interval 2.
6. Drop sequence.

7. Write a SQL Query to-
1. Create an index employee_index depends on employee table using field name.
2. Create a view depends on employee table.
3. Display the records from the view where city as Delhi and Mumbai.
4. Update the view where employee id is 'E006'.

8. Write a SQL query to illustrate numeric function.
1. Sqrt   2. Ceil   3. Power   4. Floor   5. Round
6. Mod   7. Abs   8.Exp   9.Greatest   10. Least

9. Write a SQL query to create table space data user or data where size of file 100MB extend it by 10MB reach upto 250MB in size. Create user data1 with default tablespace and temporary tablespace. Create role acc_create with create session, create user, alter user and assign role to user. Assign profile to user where user should fail after 5 attempt and valid for 3 days. Destroy user data1 and tablespace from system.

10. Write a SQL query for join, inner join, outer join, self join and Cartesian join.

Bachelor of Commerce Computer Application (BCCA) Semester-IV

60- Mathematics

UNIT – I
Introduction Scope, Data Collection and Classification: Meaning of Statistics, Variable and Attribute, Primary Data and Secondary Data, Population (or Universe)and Sample, Complete Enumeration (or Census) and Sample Survey, Statistical Enquiry, Useful Terms Classification, Tabulation, Mechanical Tabulation. **Permutation:** Introduction, Fundamental Rules of Counting, Result on Permutation Examples. **Combination:** Introduction, Result of Combination. **Set Theory :**Method of Set Representation and Notation, Types of Sets, Venn Diagram, Set Operations, Union(Set Addition), Intersection (Set Multiplication), Complement, Difference, Examples on Set Operations, Laws of Algebra of Sets, Duality, Verification of Laws (Using Venn Diagram), Proof of the Laws of Set Algebra, Number of Elements in a set

UNIT – II
Logarithm: Introduction, Definition of Logarithm, Laws of Logarithm, Common Logarithm and Natural Logarithm, Antilogarithm. **Compound Interest:** Interest Compounded Continuously, Amount at the Changing rates of Interest, Nominal and Effective rate of Interest, Growth and Depreciation. **Other Useful Mathematics Devices: Rounding** of Numbers, Absolute, Relative and Percentage Errors, Significant Figures, Some Short Processes of Calculation, Roots and Reciprocals Expressed as Power, A.P. Series and G.P. Series, Sum and Sum of the Squares of Numbers, Inequalities, Concept of Function, Polynomial, Sigma (Σ) Notation, Simple Interpolation

UNIT –III
Charts and Diagrams: Objects of Diagrammatic Representation, Types of Charts and Diagrams. **Frequency Distribution :**Observation, Frequency, Simple Series(or Ungrouped Data)and Frequency Distribution, Useful Terms Associated with Grouped Frequency Distributions, Construction of frequency Distribution, Cumulative Frequency Distribution, Relative Frequency Distribution, Diagrammatic Representation of Frequency Distributions, Frequency Curve. **Measures of Central Tendency :**Average or Measure of Central Tendency, Arithmetic Mean(A.M.), Important Properties of A.M., Simplified Calculation for A.M., Mean of Composite Group, Geometric Mean(G.M.), Properties of G.M., Harmonic Mean(H.M.), Advantages and Disadvantages of A.M.,G.M.,H.M., Relations between A.M.,G.M.,H.M., Median, Calculation of Median, Advantage and Disadvantage of Median, Mode, Calculation of Mode, Advantages and Disadvantages of Mode, Relation between Mean, Median, Mode, Partition Values - Quartiles, Deciles, Percentiles, Calculation of Partition Values. **Measures of Dispersion :**Meaning and Necessity of ₋Measures of Dispersion, Range, Quartile Deviation (Or Semi – Interquartile Range), Mean Deviation (Or Mean Absolute Deviation), Standard Deviation(S.D.), Important Properties of S.D., Calculation of Standard Deviation (σ), S.D. of Composite Group, Relation between S.D. and Other Measures, Relative Measure of Dispersion.

UNIT- IV
Moments, Skewness and Kurtosis : Moments, Relation between central and Non-Central moments, Beta coefficients and Gamma-coefficients, Standardized Variable, Moments of Frequency Distributions, Skewness, Kurtosis. **Curve Fitting: Curve** Fitting, Straight Line and Parabola, Free- hand Method of Curve Fitting, Method of Least squares, Fitting Straight line, Simplified Calculations, Fitting Parabola, Fitting Exponential and Geometric Curves. **Correlation and Regression: Concepts** of ₋correlation ₋and ₋Regression', Bivariate Data, Bivariate , Frequency Distribution, Scatter Diagram, Correlation, Covariance, Correlation Coefficient(r),Properties of Correlation coefficient, Calculation

of r, Interpretation and use of r, Variance of the Sum (Difference)of Two Series, Regression, Properties of Linear Regression, Explained Variation and Unexplained Variation, Regression Curve in Bivariate Frequency Distribution , Rank Correlation. **Time Series** : Meaning and Necessity of ‚Time Series Analysis', Components of Time Series, Adjustments to Time Series Data, Secular Trend, Measurement of Trend, Monthly Trend from Annual Data, Seasonal Variation, Measurement of Seasonal Variation, Cyclical Fluctuation, Business Forecasting, Exponential Smoothing. **Probability Theory :**Introduction, Random Experiment, Outcome, Event, Important Terminology, Techniques of Counting, Classical (or 'a Priori')Definition of Probability, Theorems of Probability, Draw without Replacement, Repeated Trials-Drawing with Replacement, Bayes' Theorem Other Approaches to Probability Theory, Set and Probability, Finite Probability Space and Assignment of Probabilities, Finite Equiprobable Sample Space and Classical Definition, Conditional Probability, Independent Events.

61- Business Law

UNIT- I
THE INDIAN CONTRACT ACT, 1872
Meaning Of Essentials Of Contract, Offer And Acceptance, Capacity Of Parties, Considerations, Free Consent, Legality Of Object And Consideration, And Agreements Opposed To Public Policy, Void Agreement And Contingent Contracts, Performance Of A Contract, Discharge Of A Contract, Remedies For Breach Of Contract, Quasi-Contracts, Indemnity And Guarantee, Bailment And Pledge, Contract Of Agency.

UNIT- II
THE SALE OF GOODS ACT, 1930:- The Sale Of Goods Act,1930, Contract Of Sale, ‚Sale' And ‚Agreement To Sell' Distinguished, Meaning & Types Of Goods, Sale/Agreement To Sell, Price. **Condition And Warranties**-Meaning, Condition & Warranty Distinguished, Express And Implied Conditions And Warranties, Doctrine Of Caveat Emptor. **Transfer Of Property-** Meaning, Rules Regarding To The Transfer Of Property, Transfer Of Property In Specific Or Ascertained Goods, Transfer Of Property In Unascertained Goods And Future Goods, Rules Relating To Transfer Of Property Of Goods Sent ‚On Approval' Or ‚On Sale Or Return', Delivery. **Rights Of Unpaid Seller** -Meaning, Right Of Lien, Right Of Stoppage Of Goods In Transit, Lien And Stoppage In Transit Distinguished, , Effect Of Sub-Sale Or Pledge By Buyer Upon The ―Two Rights Of The Unpaid Seller‖, Right Of Resale, Rights Of Seller And Buyers, Right Of Unpaid Sellers Against Buyer Personality, Auction Sale.
THE INFORMATION TECHNOLOGY ACT, 2000 :- Meaning, objectives, scheme, scope, provision relating to electronic signature, provision relating to electronic governance, acknowledgement and dispatch of electronic records, secure electronic records and secure electronic signature, regulation of certifying authorities, electronic signature certificates, duties of subscribers, penalties, compensation and adjudication, the cyber appellate tribunal, offences, constitution of advisory committee, power of controller to make regulations.

UNIT- III
THE INDIAN PARTNERSHIP ACT, 1932: Meaning & Essentials Of Partnership, Co-Ownership, Partnership Deed, Registration Of Firm, Types Of Partnership On The Basis Of Duration, Types Of Partners, Position Of Minor As A Partner, Mutual Rights And Duties, Relation Of Partners With Third Parties, Implied Authority Of Partners, Reconstitution Of Firms, Dissolution Of Firm, Settlement Of Accounts, Public Notice.
THE LIMITED LIABILITY PARTNERSHIP ACT, 2008 (LLP):-Meaning & Features Of LLP, Comparison Between Existing Partnership & LLP, Comparison Between Company & LLP, Minimum No. Of Partners, Designated Partners, Incorporation Document, Incorporation By Registration, Effects Of Registration, Registered Office Of LLP & Change Therein, Name Of LLP

and change therein, partners of LLP and change therein, cessation of partnership interest, partner as agent of LLP And Not Of Other Partners, Extent Of Liability Of LLP, Extent Of Liability Of Partner, Unlimited Liability In Case Of Fraud, Whistle Blowing, Contribution. **Account, Audit And Taxation** :- Maintenance Of Books Of Account, Other Records And Audit, Etc, Annual Return, Partners Transferable Interest, **Taxation of LLP**, Conversion From Firm Into LLP, Conversion From Private Co. Into LLP, Conversion From Unlisted Public Co. Into LLP , Winding Up Of LLP, compulsory winding up, commencement of winding up by tribunal, voluntary winding up of a LLP.

UNIT- IV

The Negotiable Instruments Act, 1881 (Part-I) :-Negotiable instrument, promissory note, bill of exchange, acceptance, distinction between bill of exchange & promissory note, cheque, distinction between a cheque and bill of exchange, crossing, bouncing or dishonor cheque, holder & holder in due course, distinction between holder & holder in due course, negotiation and assignment, distinction between negotiation and assignment, endorsement, material alteration.

The Negotiable Instruments Act, 1881 (Part-II):- liabilities of various parties, proportionate in case of partial failure of consideration, presentment for acceptance, presentment for payment, acceptance for honor, payment for honor, dishonor of bill, notice of dishonor, rights of holder in case of instrument acquired after dishonor or after maturity, noting and protesting, drawee in case of need, discharge of an instrument, discharge of a parity, distinction between discharge of an instrument & discharge of a parity, hundi, types of hundies.

62-Core Java

UNIT- I

Getting Started - The HelloWeb Applet, What is Java?, Why Learn Java, Installing and Setting Up the Java SDK, Writing Your First Application, Learning Java Syntax Basics, Writing Your First Applet! **Variables, Data Types, and Simple I/O –** The Project: the Name Game Application, Variables and Data Types, Working with Numbers, Getting Simple User Input, Strings and String Operations, Getting Back to the Name Game. **The Fortune Teller:** Random Numbers, Conditionals, and Arrays – The Project: the Fortune Teller, Generating Random Numbers, Controlling the Random Numbers Range, The If Statement, The if-else Statement, Using the Switch Statement, Understanding the Arrays, Back to the Fortune Teller.

UNIT- II

Using Loops and Exception Handling – The Project: The Number Guesser, Counting Forward with Loops, Skipping Values, Counting Backwords, Nested For Loops, Looping on Arrays, Using the while loop, Exception Handling, Back to the Numbers Guesser Program. **Blackjack: Object-Oriented Programming** – The Project: The BlackJack Application, Understanding Object-Oriented Concept, Examining Member Variables, Defining and Using Methods, Understanding Access Modifiers, The Card and CardDeck Class, Extending a Class, Back to the BackJack Game. **Creating a GUI Using the Abstract Windowing Toolkit** – The Project: MadLib Program, The java.awt Package, Using Frames, Using Components, Back to the MadLib Game Application.

UNIT- III

Advance GUI: Layout Managers and Events Handling – The Project: the AdvancedMadLib Application, Using Layout Managers, Handling AWT Events, Getting Back to the AdvancedMadLib Application. **Writing Applets** – The Project: QuizShow Applet, Understanding Applets, Including an Applet in a Web Page, Learning Applet Methods: init(), start(), stop(), and destroy(), Printing Status Messages, Writing Java Programs that Can Run as Applets or Applications, Using Sounds and Images, Back to the QuizShowApplet Applet.

UNIT- IV
The Graphics Class: Drawing Shapes, Images, and Text – The Project: Memory Game, The Graphics Class, Fonts and FontMatrics, Drawing Images, Using the Color Class, Getting Back to the Memory Game. **Custom Events Handling and File I/O –** The Project: The Block Game, Building the Block Class, Creating the BlockGrid Class, Building the PlayArea Event Model, Creating the PlayArea Class, Creating the ScorelnfoPanel Class, Creating the Block Game Application. **Creating Your Own Components and Packages** – The Project: MinePatrol, Creating Lightweight Components, Preparing to create the jpr.lightweight Package, Building the MineCell Classes, Creating the Mine Field Classes, Creating the MinePatrol Application.

63- PHP & MYSQL

UNIT- I
Getting Started With PHP- Basic HTML Syntax, Basic PHP Syntax, Using FTP, Testing Your Scripts, Sending Text To The Browser, Using The PHP Manual, Sending HTML To The Browser, Adding Comment To The Script, Basic Debugging Steps. **Variables-** What Are Variables?, Variable Syntax, Types Of Variables, Variable Values, Understanding Quotation Marks. **HTML Forms And PHP-** Creating A Simple Forms, Choosing A Form Data In PHP, Displaying Errors, Error Reporting, Manually Sending Data To A Page. **Using Numbers-** Creating The Forms, Performing Arithmetic, Formatting Numbers, Understanding Precedence, Incrementing And Decrementing A Number, Creating Random Numbers.

UNIT- II
Using Strings- Creating The HTML Forms, Concatenating Strings, Handling Newlines, HTML And PHP, Encoding And Decoding Strings, Finding Substrings, Replacing Parts Of A String. **Control Structures-** Creating The HTML Forms, The if Conditional, Validation Functions, Using Else, More Operators, Using elseif, The Switch Conditional, The For Loop. **Using Arrays-** What Is An Array, Creating An Array, Adding Items To An Array, Accessing An Array From A Form.

UNIT- III
Creating Web Applications- Creating Templates, Using External Files, Using Constants, Working With The Date And Time, Handling HTML Forms With PHP, Making Forms Sticky, Sending Email, Output Buffering, Manipulating HTTP Headers. **Cookies And Sessions-** What Are Cookies?, Creating Cookies, Reading From Cookies, Adding Parameters To Cookies, Deleting A Cookie, What Are Sessions?, Creating Session, Accessing Session Variables, Deleting Session. **Creating Functions-** Creating And Using Simple Functions, Creating And Calling Functions That Take Arguments, Setting Default Arguments Values, Creating And Using Functions That Return A Value, Understanding Variable Scope.

UNIT- IV
Files And Directories- File Permissions, Writing To Files, Locking To Files, Reading From Files, Handling File Uploads, Navigating Directories, Creating Directories, Reading Files Incrementally. **Intro To Database-** Introduction To SQL, Connecting To MYSQL, MYSQL Error Handling, Creating And Selecting A Database, Creating A Database, Inserting Data Into A Database, Securing Query Data,

Retrieving Data From A Database, Deleting Data In A Database, Updating Data In A Database. **Putting It All Together-** Getting Started, Connecting To The Database, Writing The User-Defined Function, Creating The Template, Logging In, Logging Out, Adding Quotes, Listing Quotes, Editing Quotes, Deleting Quotes, Creating The Home Page.

64- Practical

Practical List of Core Java

A1. Write an algorithm, draw a flowchart and develop a Java program to accept a number from the user and print its factorial.

A2. Write an algorithm, draw a flowchart and develop a Java program to accept three numbers from the user and print the largest number.

A3. Write an algorithm, draw a flowchart and develop a Java program to print first 10 prime numbers.

A4. Write an algorithm, draw a flowchart and develop a Java program toto print the following designs

```
"             1           1            1
" "          1 2         2 2          2 2
" " "        1 2 3       3 3 3        3 3 3
" " " "      1 2 3 4     2 2          4 4 4 4
```

A5. Write an algorithm, draw a flowchart and develop a Java program to accept any 10 numbers from the user to store it in an Array and print the largest of all.

A6. Write an algorithm, draw a flowchart and develop a Java program to multiply two matrices by accepting matrix elements from the user.

A7. Write an algorithm, draw a flowchart and develop a Java program to accept 10 names from the user to store them in array of string and print them in Alphabetical order.

A8. Write an algorithm, draw a flowchart and develop a Java program to demonstrate multilevel inheritance.

A9. Write an algorithm, draw a flowchart and develop a Java program to demonstrate object references.

A10. Write an algorithm, draw a flowchart and develop a Java program to accept any digit number from the user and print its reverse.

A11. Write an algorithm, draw a flowchart and develop a Java program to find area of rectangle, square, cylinder using the concept of method overloading.

A12. Write an algorithm, draw a flowchart and develop a Java program to accept a number from the user and search that number in array of numbers.

A13. Write an algorithm, draw a flowchart and develop a Java program to demonstrate method overriding and method overloading.

A14. Write an algorithm, draw a flowchart and develop a Java program to define a package P1 with class A having method show1() and show2(). Write another class B in package P2 to access elements of class A in it.

A15. Write an algorithm, draw a flowchart and develop a Java program to declare abstract class student having methods getName(), showName() and define these methods in another class B and access them.

A16. Write an algorithm, draw a flowchart and develop a Java program to demonstrate
  I. public variables and methods

    II. private variables and methods
    III. Final class and Methods
    IV. Default Variables
    V. Protected Variables and Methods

A17. Write an algorithm, draw a flowchart and develop a Java program to display the following using Applet

```
A
A P
A P P
A P P L
A P P L E
A P P L E T
```

A18. Write an algorithm, draw a flowchart and develop a Java program to design user login screen using Applet and provide the facility of valid user login.

A19. Write an algorithm, draw a flowchart and develop a Java program to draw following using graphics class methods in a frame.

A20. Write an algorithm, draw a flowchart and develop a Java program to demonstrate multithreading using moving balls example in a frame.

A21. Write an algorithm, draw a flowchart and develop a Java program to demonstrate multithreading using moving strings example in a frame.

A22. Write an algorithm, draw a flowchart and develop a Java program to change color of applet window with following condition
    a. Green Color should be for exact 3 sec
    b. Red color should be for exact 1 sec

A23. Write an algorithm, draw a flowchart and develop a Java program to accept two numbers from user and perform their division. Define an array with size 10, accept index number from the user and store the value at that index of the array. The exception if occurred for division should be handled in inner try block and exception for array storage should be handled at outer try block.

A24. Write an algorithm, draw a flowchart and develop a Java program to define an user defined exception sal_out_of_range and write a class named employee with fields id, name, sal, phno and accept details of user according to id and store in the variables, if sal exceeds 10000, sal_out_of_range should be thrown and handled properly.

A25. Write an algorithm, draw a flowchart and develop a Java program to design a registration form for new user creation. It should include fields such as First_Name, Last_Name, User_Name, Password, Confirm_Password and Email. After user enters complete data and clicks on Ok button, a dialog box should display message of successful user creation else user creation failed message should be displayed. A validation for password and confirm password should be performed in this practical.

A26. Write an algorithm, draw a flowchart and develop a Java program to handle all mouse events using an example of cursor movement on a frame.

A27. Write an algorithm, draw a flowchart and develop a Java program to demonstrate card layout manager.

A28. Write an algorithm, draw a flowchart and develop a Java program to add a text field, a choice control and a label on a frame. User should enter some text in the text field then after hitting the enter key, entered texts hould be added to choice control and label should display the number of items present in the choice control.

A29. Write an algorithm, draw a flowchart and develop a Java program to design a menu called Text with MenuItems like Set Fore Color, Set Back Color, Set Font to the text in the TextField on the Frame.

A30. Create a class named EmpAccDetails, add a method getEmpAccDetails to accept Account Details of Employee such as income tax paid, grosssal, basic sal, HRA allowance. Add this class to a package EMP. Create another class called EmpDetails with method getEmpPerDetails, also access getEmpAccDetails in the same class by importing the EMP Package.

A31. Write an algorithm, draw a flowchart and develop a Java program to create three child Threads, all threads should print numbers from 1 to 10 but condition is that Thread 1 whenever starts printing the number should print all numbers completely without any break and then Thread 2 and 3 should print values as per the priority set by the system.

A32. Write an algorithm, draw a flowchart and develop a Java program to accept 10 numbers from the user, store it in an Array and print them in Ascending order, also print largest and smallest number of the array.

A33. Write an algorithm, draw a flowchart and develop a Java program to demonstrate Parameterized Applet by loading images to the Applet Window using specific name from the Parameter.

Practical List of PHP & My-SQL

1. Write an algorithm, draw a flowchart and Write a PHP script to print the value of variable in PHP and use print function for printing.
2. Write an algorithm, draw a flowchart and Write a PHP script to print the values of variable using echo.
3. Write an algorithm, draw a flowchart and Write a PHP script to print the following pattern using nested loop.
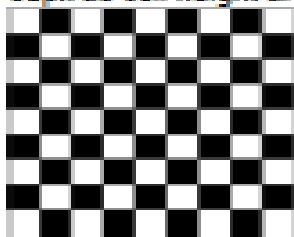   ```
   .
   . .
   . . .
   . . . .
   . . . . .
   ```
4. Write an algorithm, draw a flowchart and Write a PHP script to that creates the following table using for loops. Add cell padding="3px" and cell spacing="0px" to the table tag.

| 1 * 1 = 1 | 1 * 2 = 2 | 1 * 3 = 3 | 1 * 4 = 4 | 1 * 5 = 5 |
|-----------|-----------|-----------|-----------|-----------|
| 2 * 1 = 2 | 2 * 2 = 4 | 2 * 3 = 6 | 2 * 4 = 8 | 2 * 5 = 10 |
| 3 * 1 = 3 | 3 * 2 = 6 | 3 * 3 = 9 | 3 * 4 = 12 | 3 * 5 = 15 |
| 4 * 1 = 4 | 4 * 2 = 8 | 4 * 3 = 12 | 4 * 4 = 16 | 4 * 5 = 20 |
| 5 * 1 = 5 | 5 * 2 = 10 | 5 * 3 = 15 | 5 * 4 = 20 | 5 * 5 = 25 |
| 6 * 1 = 6 | 6 * 2 = 12 | 6 * 3 = 18 | 6 * 4 = 24 | 6 * 5 = 30 |

5. Write an algorithm, draw a flowchart and Write a PHP script using nested for loop that creates a chess board as shown below. Use table width="270px" and take 30px as cell height and width.



6. Write an algorithm, draw a flowchart and Write a PHP script toInsert a new item in an array on any position.
7. Write an algorithm, draw a flowchart and Write a PHP script tosort an array of positive integers using the Sort function asort() and ksort().
8. Write an algorithm, draw a flowchart and Write a PHP script tofor Creating, Retrieving and Deleting data from the cookie using POST Method.
9. Write an algorithm, draw a flowchart and Write a PHPscript to convert a date from yyyy-mm-dd to dd-mm-yyyy.
   Sample Date:2012-09-12
   Expected Result: 12-09-2012
10. Write an algorithm, draw a flowchart and Write a PHP script toremove the whitespaces from a string.
11. Write an algorithm, draw a flowchart and Write a PHP function that checks if a string is all lower case.

12. Write an algorithm, draw a flowchart and Write a PHP script tocheck whether a entered string is palindrome or not

13. Write an algorithm, draw a flowchart and Write a PHP script toprint Fibonacci series using recursion.

14. Write an algorithm, draw a flowchart and Write a PHP script using switch case and dropdown list display a - Hello|| message depending on the language selected in drop down list.

15. Write an algorithm, draw a flowchart and Write a PHP script toreplace the first 'the' of the following string with 'That' –

16. Sample: 'the quick brown fox jumps over the lazy dog.'

17. Expected Result: That quick brown fox jumps over the lazy dog.

18. Write an algorithm, draw a flowchart and Write a PHP script to check that emailid is valid or not.

19. Write an algorithm, draw a flowchart and Write a PHP script to create a simple 'birthday countdown' script, the script will count the number of days between current day and birth day.

20. Write a SQL statement to create simple table countries including columns country_id, country_name and region_id.

21. Write a SQL statement to create table countries including columns country_id, country_name and region_id and make sure that the column country_id will be unique and store an auto incremented value.

22. Write a SQL statement to create a table named countries including columns country_id, country_name and region_id and make sure that no countries except Italy, India and China will be entered in the table.

23. Write a SQL statement to insert a record with your own value into the table countries against each columns region_id.

24. Write a SQL statement to rename the table countries to country_new.

# Bachelor of Commerce (Computer Application) BCCA Semester V

**65**- **Computerized Accounting using Tally**

**UNIT-I** Introduction to Tally.ERP 9- Features of Tally, Enhancement in Tally.ERP 9, Installation Procedure of Tally.ERP 9, Opening Tally.ERP 9, Components of the Tally.ERP 9 Window, Creating a Company.Stock and Godown in Tally- Stock Groups, Stock Categories, Stock Items, Units of Measure, Godowns.

**UNIT-II** Groups, Ledgers, Vouchers and Orders- Introducing Groups, Introducing Ledgers, Introducing Vouchers, Introducing Purchase Orders, Introducing a Sales Order, Introducing Invoices. Reports in Tally.ERP 9- Working with Balance Sheet, Working with Profit & Loss A/c Report, Working with Stock Summary Report, Understanding Ratio Analysis, Working with Trial Balance Report, Working with Day Book Report.

**UNIT-III** Exploring Payroll in Tally.ERP 9- Working with Payroll Vouchers, Defining Payroll Reports, Working with Statements of Payroll Report, Describing Salary Disbursement.Taxation- Indian Tax Structure, Tax Deducted at Source in Tally.ERP 9, Create a Tax Ledger, TDS Vouchers, Printing a TDS Challan, Tax Collected at Source in Tally.ERP 9, TCS Reports in Tally.ERP 9, Calculating VAT in Tally.ERP 9, VAT C

**UNIT-IV** Important Features of Tally.ERP 9- Taking Backup in Tally.ERP 9, Restoring Data in Tally. ERP 9, Using E-mail in Tally.ERP 9, Migrating Data from Tally 7.2 to Tally.ERP 9, Tally.NET in Tally.ERP 9- Configuring the Tally.NET Feature, Assigning Security Levels, Creating Security Controls, Connecting a Company to the Tally.NET Server, Logging as a Remote User.

**- Practical: Based on Computerized Accounting**
1. **Create a company in Tally.Erp 9 with the following details:**

| Name of company | Universal Company Ltd. |
|---|---|
| Address | 1804, world Tower, AB road, Baner, Pune _411080 |
| Country | India |
| State | Maharashtra |
| Contact number | 7894561230 |
| Mobile number | 7741258963 |
| Email-Id | info@universalmfg.co.in |
| Books beginning from | 01-04-2015 |
| Financial year Beginning from | 01-04-2015 |

## 2. Create a company in Tally.Erp 9 with the following details:

| Name of company | Sambhav trading Company |
|---|---|
| Address | a/512, palm court, girgaam chaupaty, charni road, Mumbai-400007 |
| Country | India |
| State | Maharashtra |
| Contact number | 022-22886512 |
| Mobile number | 9898745555 |
| Email-Id | enquiry@sambhav.com |
| Books beginning from | 01-04-2014 |
| Financial year Beginning from | 01-04-2014 |

### 3.Create the following ledgers in the books of universal company ltd.

| Name of ledger | Under (group) | Bill wise details set to | Opening balance |
|---|---|---|---|
| Share capital | Capital account | No | 15,00,000 |
| Purchase account | Purchase account | No | Nil |
| Sales accounts | Sales accounts | No | Nil |
| Ultra tech cement ltd | Sundry creditors | yes | 270000 |
| Building | Fixed assets | No | 1200000 |
| Computers | Fixed assets | No | 50000 |
| Office furniture | Fixed assets | No | 175000 |
| Cash in hand | Cash accounts | No | 20000 |
| Civic centre association | Sundry debtors | yes | 290000 |
| Bank of india | Bank accounts | No | 80000 |
| Petty cash | Cash in hand | No | 50000 |

### 4.Create the following ledgers in the books of universal company ltd.

| Name of ledger | Under (group) | Bill wise details set to | Opening balance |
|---|---|---|---|
| Proprietors capital | Capital account | No | 10,00,000 |
| Purchase account | Purchase account | No | Nil |
| Sales accounts | Sales accounts | No | Nil |
| Hindustan unilever ltd | Sundry creditors | yes | 355000 |
| Land and Building | Fixed assets | No | 850000 |
| Computers and peripheral | Fixed assets | No | 30000 |
| Office furniture | Fixed assets | No | 75000 |
| Cash in hand | Cash accounts | No | 18000 |
| Tahuraa Traders Pvt. ltd | Sundry debtors | yes | 310000 |
| Bank of Baroda | Bank accounts | No | 102000 |

**5. Record the following vouchers in the books of Universal company ltd.**
- 04-04-2014 withdrawn Rs. 20000 from bank of india and transferred to petty cash book.
- 08-04-2014 paid 2000 from petty cash for buying stationery for office.
- 15-04-2014 made purchase from ultra tech cement ltd. Worth Rs. 45000
- 19-04-2014 issued cheque to ultra tech cement ltd for Rs. 45000
- 21-04-2014 sold goods worth of Rs. 75000 to civic centre association
- 25-04-2014 received a cheque from civic center association for Rs. 75000. The samewas deposited in the bank on the same date.
- 30-04-2014 paid staff salary of Rs. 9800 from petty cash

**6. Record the following vouchers in the books of Sambhav Trading Co. Pvt. ltd.**
- 02-04-2014 withdrawn RS. 10000 From bank of broadband transferred to petty cash book.
- 05-04-2014 paid 1000 from petty cash for office expenses.
- 11-04-2014 made purchase from Hindustan unilever ltd. Worth Rs. 33000
- 13-04-2014 Issued cheque to Hindustan Unilever Ltd. For Rs. 20000
- 14-04-2014 Made purchase from Hindustan Unilever Ltd. Worth Rs. 26000
- 18-04-2014 Issued cheque of Rs. 38000 to Hindustan Unilever Ltd.
- 21-04-2014 sold goods worth of Rs. 90000 to Tahuraa Traders Pvt Ltd.
- 22-04-2014 received a cheque from Tahuraa Traders Pvt Ltd. For Rs. 75000 . The same was deposited in the bank on the same date.
- 23-04-2014 sold goods worth of rs. 85000 to Tahuraa Traders Pvt Ltd.
- 25-04-2014 received cheque from Tahuraa Traders Pvt Ltd. From Rs.75000. The same was deposited in the bank on the same date.
- 30-04-2014 Paid staff salary of Rs. 7200 from petty cash.

**7. Journalize the following transaction in the books of Sanjay Poddar for the monthof March 2012.**

| March 2012 | Particular | Amt |
|---|---|---|
| 1 | Sanjay commenced business with cash | 40000 |
| 2 | Bought goods for cash | 25000 |
| 5 | Deposit in Bank | 50000 |
| 7 | Bought goods in credit from Anand | 15000 |
| 10 | Sold goods to Prakash | 7000 |
| 12 | Purchase Machinery Payment made by Cheque | 10000 |

**8. Journalize the following transaction in the books of Prashant for April 2011 prepare Balance sheet.**

| April 2011 | Particular | Amt |
|---|---|---|
| 1 | Start business with capital borrowed from his friend Satish | 1,10,000 |
| 3 | Bought Machinery | 40,000 |
| 5 | Sold goods for cash to Satish | 25000 |
| 7 | Purchase goods from Somesh | 30000 |
| 9 | Bought goods for cash from Nitin | 26000 |
| 11 | Cash sales | 10000 |
| 15 | sold goods to Manish | 8000 |

3. **Journalize the following transaction in the books of Rahul Thakur for the month of March 2012 and prepare profit and loss account.**

| March 2012 | Particulars | Amt |
|---|---|---|
| 1 | Start Business with Furniture | 15000 |
| | And machinery | 40000 |
| 2 | Borrowed from central Bank | 45000 |
| 5 | Bought goods | 30000 |
| 8 | Sold goods to Manoj on credit | 12000 |
| 10 | Paid Electricity Bill | 1500 |
| 13 | Bought Stationary from Vikas | 8500 |

4. **Journalize the following transaction in the books of Rupesh for the year ended March 2012 and prepare Profit and loss account.**

| March 2012 | Particulars | Amt |
|---|---|---|
| 1 | Rupesh commenced business with cash | 80000 |
| 2 | Bought goods on credit from Ramesh | 15000 |
| 6 | Paid into Bank | 8000 |
| 8 | Bough from Sanket on credit | 15000 |
| 10 | Bought goods for cash | 12000 |
| 12 | Received goods from Sukesh | 7500 |
| 15 | Goods sold on credit to Chanda | 9000 |

5. **Create cost centers Project A and Project B under primary cost category and record the following transaction in the books of sambhav trading company**
   a. On 07-09-2014, purchased Cement worth Rs. 1, 50,000/- from Ultratech cement Ltd. That will be shared equally between Project A and Project B. A credit period of 30 days was provided.
   b. Record transaction on 09-09-2014 for the purchase of Steel worth Rs. 4,50,000/- from Embee Enterprises. Allocate Rs. 50,000/- to Project A and the the rest to Project B. a credit period of 45 days was allowed.

6. **Create cost centers Mumbai and Pune under primary cost category and record the following transaction in the books of Universal co. Limited**
   a. On 05-10-2014, purchases done worth Rs. 2, 50,000/- from Hindustan Unilever Ltd. That will be shared equally between Mumbai and Pune.

b. Record transaction on 09-10-2014 for the purchase worth Rs. 6,00,000 /- from Hindustan Unilever Ltd. Allocate Rs. 2,50,000/- to Mumbai and the rest to Pune. A credit period of 45 days was allowed.

c. On 18-10-2014 record a transaction for the sale on Super technologies for Rs. 15,75,000/- of which 1200000 would be allocated to Mumbai branch and the rest to Pune.

d. On 22-10-2014 one more sales entry was made for Rs. 16,00,000/- to Super technologies of which Rs. 10,00,000/- was allocated to pune branch and the rest to Mumbai.

7. **Record the following transaction in the books of Universal Co. Ltd.**
   a. On May 11/2014 they received a bill no. May /005/2014 for a sum of Rs. 125000/- from M/s. Rajesh shah and Co., architects for consultancy towards designing their office and training centre.
   b. Universal company Ltd. Made the payment after deducting the TDS amount.
   c. On 27th May 2014, company received bill no May/015/2014 for a sum of Rs. 75000 from M/s Rajesh shah and co., architects for consultancy.
   d. On 28thMay, company made the payment after deducting TDS.

8. **Record the following transaction in the books of Raj enterprises.**
1. Goods purchase from -Kirti sales‖ on credit Bill no. 115 Rs. 62000
   a. Color tv (lg) 4% 3qty Rs. 30000
   b. Washing machine (Samsung) 4% 4 qty Rs. 32000
2. Cash received from sangamenter prizes Rs. 15000
3. Goods purchase in cash bill no. 69 Rs. 35000
   a. B/W tv (Sony) 4% 4 qty Rs. 20000
   b. Audio (onida) 4% 5 qty Rs. 15000
4. Goods sale on cash rs, 19000
   a. Color tv (Lg) 4% 1 qty Rs. 15500
   b. Audio (Onida) 4% 1 qty Rs. 3500
5. Goods purchase in cash from vikram enterprises bill no. 45 Rs. 40000
   a. Color tv (lg) 4% 2 qty Rs. 20000
   b. Refrigerator (Videocon) 4% 2qty Rs. 20000
6. Cheque no. received from ravi agency Rs. 10000 and deposited in state bank .
7. Credit sale to vijay enterprises bill no. 93 Rs.17200
   a. Washing machine (Samsung) 4% 1qty Rs. 8000
   b. B/W tv (Sony) 4% 1 Qty Rs. 5700
   c. Audio (Onida) 4% 1 qty Rs. 3500
8. Cash paid to ravi kulkarnirs. 1500
9. Cheque no. 159 paid to central engineering co. Rs 15000
10. Refrigerator purchase on cash Rs. 30000 fom k k agency 3 qty (Videocon) 4%
11. Office rent paid in cash Rs. 1700
12. Received cheque from vijay enterprises Rs. 10000 & deposited in canara bank.
13. Bill received from lokmat Rs. 1500 bill no.5
14. Amount received from vaishali agency in cash rs. 5000 & cheque no. 336791 Rs. 10000 only. Cheque deposited in state bank.
15. Cash sale to Telco ltd. Rs. 29900

a. Color tv (Lg) 4% 1 qty Rs. 10000
b. Washing machine (Samsung) 4% 1 qty Rs. 9100
c. Refrigerator (Videocon) 4% 1qty Rs. 10800
16. Cheque deposited in canara bank Rs.5000
17. Cash withdrawn from bank Rs. 34000

**15. Record the following transaction in the books of Maharashtra Traders.**

1. Opening stock for Wadi Godown
   a. Akai color TV 4% 10 qty Rs.10500 each.
   b. Refrigerator (Videocon) 7qty 12000 each.
   c. Washing machine (Samsung) 5 qty 8000 each
   d. Audio (Philips) 4% 2Qty 2000
   e. Onida color tv 4% 5 qty 12000        each
   f. B/W tv (akai) 4%  5 qty 18000

2. Opening stock for nandanwangodown
   a. Akai color tv 2 qty 10500 each
   b. refrigerator (Videocon) 3qty 12000 each
   c. Audio (Philips) 3 qty 1000 each.
3. Cash sale to Bhagwandas Co. Rs. 41500 in wadi godown.
   a. Color tv (akai) 4% 2 qty Rs.21000.
   b. Refrigerator (Vedeocon) 4% 1qty Rs. 11300
   c. Washing Machine (samsung) 4% 1 qty Rs. 9200.
4. Goods purchase in cash from national Trading co. & store Nandanwan godown.
   a. Audio (Philips) 2qty 4% Rs.6000
   b. W/M (Samsung) 1qty 4% Rs. 10000
5. Credit sales to Ravina traders Rs. 51800 wadi godown.
   a. Refrigerator (Videocon) 2qty 4% Rs. 22000.
   b. W/M (Samsung) 1qty 4% Rs.8300
   c. Color tv (akai) 2qty 4% 21500
6. Cheque received from vikas enterprises Rs. 20000 & deposited in state bank.
7. Cash withdrawn from state bank cheque no. 16 Rs. 15000/-
8. Received loan from state bank Rs. 10,00,000/- invested in business, interest 10%.
9. Cheque paid to kirti sales rs. 25000/-
10. Goods purchase on credit from rama & sons Rs. 44000 store nandanwan. a. W/M (Lg) 3 qty 4% Rs. 24000
    b. Refrigerator (Videocon) 1qty 4% Rs. 10000.
    c. Color tv (onida) 1qty 45 Rs. 10000
11. Akai color Tv purchase in cash Rs. 20000 2qty 4% Rao store in nandanwan.
12. Paid salary Rs. 10000
13. Paid bank loan Rs. 8,00,000
14. Cash sale on wadi godown Rs        42000\
    a. Audio 2 qty 4% Rs.7000
    b. w/m (s.s.) 2qty 4% Rs. 17000
    c. b/w tv (akai) 3qty 4% Rs. 18000
15. Paid to rama & sons by cheque Rs. 18000 chq. No. 1152.
16. Paid electric bill Rs. 10000
17. Total cash sale after allowing discount Rs. 1000.

18. Paid total balance loan on state bank.
19. Advertisement exp. Rs.10000
20. Carriage exp. Rs. 5000
21. Purchase furniture for nandan wangodown Rs.28000 in cash.
22. Withdrawn for personal use Rs, 10000.

**16. Record the following transaction in the books of Rathore Traders.**
1. Goods purchase from sohan & sons Rs. 20000/- a.Gold
   10gm (12.5%) Rs. 10000/-
   b. Silver 1kg (12.5%) Rs.10000/-
2. Goods purchase from sagar computer Rs. 25000/-
   a. Monitor (Compaq) 1qty 5000/-  4%
   b. Cpu (Intel)          1qty 15000/- 4%
   c. Speaker (Logitec) 1qty 5000/- each
3. Goods sold on cash Rs. 22000/- a.Gold
   (12.5%) 10gm 12000/-
   b. Silver(12.5%) 1kg 10000/-
4. Withdrawn 400/- Rs. From canara bank.
5. Cash given to sagar computers Rs. 24000/- in full settlement.
6. Cheque given to mr.sohan& sons. Rs 20000.
7. Salary given to mr.sahil Rs. 2000/-
8. Withdrawn Rs. 4000/-
9. Paid insurance premium Rs. 200/-
10. Purchase table without vat Rs.2000/

# 66- VB.Net

**UNIT- I** Welcome to Visual Basic.NET – Windows Versus DOS Programming, Installing Visual Basic.NET, The Visual Basic.NET IDE, Creating a Simple Application, Using the Help System. The Microsoft.NET Framework – Microsoft's Reliance on Windows, Writing Software for Windows, Common Language Runtime, The Common Type System and Common Language Specification. Writing Software – Information and Data, Variables, Comments and Whitespaces, Data Types, Sorting Variables, Methods. Controlling the Flow – Making Decisions, The if Statement, Select Case, Loops.

**UNIT- II** Working with Data Structure – Understanding Array, Understanding Enumerations, Understanding Constants, Structures, Working with Collection and Lists, Building Lookup Tables with Hashtable, Advanced Array Manipulation. Building Windows Application – Responding to Events, Building a Simple Application, Creating Complex Applications, Using Multiple Forms. Displaying Dialog Boxes – The MessageBox Dialog box, The Open Dialog Control, The Save Dialog Control, The FontDialog Control, The ColorDialog Control, The PrintDialog Control.

**UNIT- III** Creating Menu – Understanding Menu Features, Creating Menu, Context Menu. Debugging and Error Handling – Major Error Types, Debugging, Error Handling. Building Objects –pg. 80 Understanding Objects, Reusability, Our First Object, Constructor, Inheritance, The Framework Classes.

**UNIT- IV** Accessing Database – What is Database, SQL Select Statement, Queries in Access, Data Access Components, Data Binding. Database Programming with SQL Server and ADO.NET – ADO.NET, The ADO.NET Classes in Action, Data Binding. Deploying Your Application – What is Deployment?, Creating a Visual Studio .NET Setup Application, Assemblies as Installers, The Core of Deployment, Deploying Different Solution, Advance Deployment Option.

**67-System analysis & Design**

**UNIT- I** System Concept And The Information Systems Environment- Introduction, The Systems Concept, Characteristics Of A System, Elements Of A System, Types Of A System. The System Development Life Cycle - Introduction, System Development Life Cycle, Considerations forthe Candidate System, Prototyping.The Role Of System Analyst- Introduction, Definition, Historical Perspective, What Does It Take To Do Systems Analysis?, The Multifaceted Role Of The Analyst, The Analyst/User Interface, The Place Of The Analyst In The MIS Organization, Rising Positions In System Development, Conclusions.

**UNIT- II** System Analysis- System Planning And The Initial Investigation- Introduction, Bases For Planning In System Analysis, Initial Investigation.Information Gathering- Introduction, What Kinds Of Information Do We Need?, Where Does Information Originate?, Information Gathering Tools. The Tools Of Structured Analysis- Introduction, What Is Structured Analysis?, The Tools Of Structured Analysis. Feasibility Study- Introduction, System Performance Definition, Feasibility Study.

**UNIT- III** System Design- The Process And Stages Of System Design- Introduction, The Process Of Design, Design Methodologies, Major Development Activities, Audit Consideration. Input/output And Forms Design- Introduction, Input Design, Output Design, Forms Design. File Organization And Data Base Design- Introduction, File Structure, File Organization, Data Base Design, The Role Of The Data Base Administrator.

**UNIT- IV** System Implementation- System Testing And Quality Assurance- Introduction, Why System Testing?, What Do We Test For?, The Test Plan, Quality Assurance, Trends In Testing, Role Of Data Processing Auditor. Implementation And Software Maintenance- Introduction, Conversion, Combating Resistance To Change, Post- Implementation Review, Software Maintenance. Hardware/ Software Selection And The Computer Contract- Introduction, The Computer Industry, The Software Industry, A Procedure For Hardware/ Software Selection, Financial Considerations In Selection, The Used Computer, The Computer Contract.

**68- Cost & Management Accounting**
**UNIT- I**
Introduction to Cost and Management Accounting: Accounting Framework And Taxonomy, From Cost Accounting To Cost Management, The Dimensions Of Management Accounting. Forces Shaping Business Environment And Their Effect On Cost And Management Accounting: Drivers Defining The Future Of Business And Accounting, Trends In Cost And Management Accounting, Evolving Role Of Cost And Management Accountants, Profession Of Cost And Management Accountants.

**UNIT- II**
**Strategic Management Accounting:** Linking Strategy to Management Accounting Value Chain for Strategic Management Accounting, Life Cycle Costing, Target Costing, Kaizen Costing. **Cost Measurement and Estimation:** Definition and Measurement Of Cost, Costs On Financial Statements, The Statements Of Financial Position, The Income Statement, Cost Classification, Cost Estimation Methods.

**UNIT- III**
**Costing Systems:** Alternative Cost Accumulation Systems—Contingency Based Approach To Accounting, Levels Of Costing Systems, Income Analysis Under Alternative Costing Systems, Reconciling Income Under Alternative Costing Systems, Impact Of Just In Time (JIT) Inventory System. **Job Order Costing:** An Overview Of Traditional Costing Systems, Job Order Costing System For Manufacturing Companies, Job Order Costing System For Service Companies, Job Order Costing For Planning Purposes

**UNIT-IV**

**Process Costing:** Product And Cost Flows Through Process Costing System, Calculating Unit Cost, Process Costing Methods, Production Cost Report, Operation Costing, Accounting For By- Products, Allocation Of Support Service Costs. Activity- Based Costing And Customer Profitability Analysis: Traditional Volume-Based Costing, Activity Based Costing (abc), Comparison Of Traditional Volume-Based With The Activity-Based Costing, Advantage And Disadvantages Of Activity-Based Costing, Activity-Based Management(ABM), Scope And Advances In Activity Based Costing, Customer Profitability Analysis.

**69- Practical**

Practical List of VB. Net

1.      Write an algorithm, draw a flowchart and develop a VB.NET console application t calculate the reverse of a number.

2.      Write an algorithm, draw a flowchart and develop a VB.NET console application to implement the Cos series.

3.      Write an algorithm, draw a flowchart and develop a VB.NET console application to find largest and second largest number from the array.

4.      Write an algorithm, draw a flowchart and develop a VB.NET console application to create all possible sets from given set {1, 2, 3}.

5.      Write an algorithm, draw a flowchart and develop a VB.NET console application to display the following pattern –

<div align="center">

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\* \*

\* \* \* \*

\* \* \* \* \* \*

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6.      Write an algorithm, draw a flowchart and develop a VB.NET console application to check a number is palindrome or not.

7.      Write an algorithm, draw a flowchart and develop a VB.NET console application to calculate the binary number from decimal number.

8.      Write an algorithm, draw a flowchart and develop a VB.NET console application to check a given number is prime or unprimed.

9.      Write an algorithm, draw a flowchart and develop a VB.NET console application to calculate the reverse of a string and check the string is palindrome or not.

10.     Write an algorithm, draw a flowchart and develop a VB.NET console application to Search an element from characters and as well as from numbers using linear search method.

11.     Write an algorithm, draw a flowchart and develop a VB.NET console application to sort a given string in the order of alphabets, digits & symbol.

12.     Write an algorithm, draw a flowchart and develop a VB.NET console application to input array element, sorting them using bubble sort method.

13.     Write an algorithm, draw a flowchart and develop a VB.NET console application tocreate jagged array.

14.     Write an algorithm, draw a flowchart and develop a VB.NET console application to demonstrate exception handling.

15. Write an algorithm, draw a flowchart and develop a VB.NETwindows application to check the user id and password is valid or not

16. Write an algorithm, draw a flowchart and develop a VB.NETwindows application to create a calculator.

17. Write an algorithm, draw a flowchart and develop a VB.NETwindows application to create notepad.

18. Write an algorithm, draw a flowchart and develop a VB.NET windows application to demonstrate MDI form.

19. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create a start menu using status bar.

20. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create a menu and perform any operation.

21. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create MDI and arrange all forms as tiles and cascade form.

22. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create popup menu.

23 Write an algorithm, draw a flowchart and develop a VB.NET windows application to create data bound control for retrieving the data from database.

24. Write an algorithm, draw a flowchart and develop a VB.NET windows application to create different dialog box and perform any operation.

# Bachelor of Commerce (Computer Application) BCCA Semester VI

**70- C#.Net**

## UNIT - I

**Introducing C# -** What is C#? Evaluation of C#, Characteristics of C#, Application of C#, how does C# differ from C++? How does C# differ from Java? **Understanding .NET: The C# Environment –** The .NET Strategy, The Origin of .NET Technology, The .NET Framework, The Common Langue Runtime, Framework Base Class, User and Program Interface, Visual Studio
.NET, .NET Languages, Benefits of the .NET Approach, C# and
.NET. **Overview of C#** - Introduction, A Simple C# Program, Namespaces, Adding Comments, Main Running Value, Using Aliases for Namespaces Classes, Passing String Objects to WriteLine Method, Command Line Argument, Main with Class, Providing Interactive Input, Using Mathematical Function, Multiple Main Methods, Compile Time Error, Program Structure, Program Coding Style. **Literals, Variables and Data Types** – Introduction, Literals, Variables, Data Types, Value Types, Reference Type, Declaration Types, Initialization of Variables, Default Value, Constant Variable, Scope of Variables, Boxing and Unboxing. **Operators and Expressions** – Introduction, Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expressions, Evaluation of Expressions, Precedence of Arithmetic Operators, Type Conversion, Operator Precedence and Associativity, Mathematical Function.

## UNIT - II

**Decision Making and Branching** – Introduction, Decision Making with if Statement, Simple if Statement, The if…else Statement, The else if Ladder, The Switch Statement, The ? : Operator, Decision Making and Looping – Introduction, The while Statement, The do Statement, The for Statement, The foreach Statement, Jumps in Loops. **Methods in C#** - Introduction, Declaring Methods, The Main Method, Invoking Methods, Nesting of Methods, Method Parameters, Pass byValue, Pass by Reference, The Output Parameters, Variables Argument List, Methods Overloading. **Handling Arrays** – Introduction, One-Dimensional Array, Creating an Array, Two- Dimensional Array, Variable-Size Arrays, TheSystem.Array Class, ArrayList Class. Manipulating Strings – Introduction, Creating String, String Methods, Inserting String, Comparing String,Finding String, Mutable String Arrays of String, Regular Expressions.

## UNIT - III

**Structures and Enumerations** – Introduction, Structure, Structs with Methods, Nested Structs, Difference between Classes and Structs, Enumerations, Enumerator Base Type, Enumerator type Conversion. **Classes and Objects** - Introduction, Basic Principle of OOP, Defining a Class, Adding Variables, Adding Methods, Member Access Modifiers, Creating Objects, Accessing Class Members, Constructors, Overloaded Constructors, Static Members, Static Constructors, Private Constructors, Copy Constructors, Destructors, Member Initialization, The This Reference, Nesting of Members, Constant Members, Read-only Members, Properties, Indexers. **Inheritance and Polymorphism** – Introduction, Classical Inheritance, Containment Inheritance, Defining a Subclass, Visibility Control, Defining Subclass Constructors, Multilevel Inheritance, Hierarchical Inheritance, Overriding Methods, Hiding Methods, Abstract method, Sealed Class: Preventing Inheritance, Sealed Methods, Polymorphism.

## UNIT - IV

**Interface: Multiple Inheritances** – Introduction, Defining an Interface, Extending Interface, Implementing Interface, Interface and Inheritance, Explicit Interface Implementation, Abstract Class and Interface. **Operator Overloading** – Introduction, Overloadable Operators, Need for Operator Overloading, Defining Operator Overloading, Overloading Unary Operator, Overloading Binary Operator, Overloading Comparison Operator. **Managing Errors and Exceptions** – Introduction, What is Debugging?, Types of Errors, Exceptions, Syntax of Exception Handling Code, Multiple Catch Statements, The Exception Hierarchy, General Catch Handler, Using Finally Statement, Nested Try Blocks, Throwing Our Own Exceptions, Checked and Unchecked Operators, Using Exceptions for Debugging.

**71- Python**

**UNIT – I**

Getting Started -Introducing python, Installing python on windows, Installing python on Linux, Meeting the interpreter, Writing your first program, Employing variables, Obtaining user input, Correcting Errors. Performing operations-Doing arithmetic, Assigning values, Comparing Values, Assessing logic. , Examining Conditions, Setting precedence, casting data types, Manipulating bits. Making statements -Writing lists, Manipulating lists, Restricting lists, associating list elements, Branching with if, Looping while true, Looping over items, Breaking out of loops.

**UNIT - II**

Defining Functions-Understanding scopes, Supplying arguments, Returning Values, Using callbacks, Adding placeholders, producing generators, Handling exceptions, Debugging assertions. Importing Modules - ,Storing functions, Owning function names, Interrogating the system, Performing mathematics, Calculating decimals, Telling the time, Running a timer, Matching patterns.

**UNIT - III**

**Managing strings -**Manipulating strings, Formatting strings, Modifying strings, Accessing files, Reading and writing files, Updating file strings, Pickling data **Programming objects**,Encapsulating data, Creating instance objects, Addressing class attributes, Examining built-in attributes, Collecting garbage, Inheriting features, Overriding base methods, Harnessing polymorphism.

**UNIT - IV**

**Processing requests-**Sending responses, Handling values, Submitting forms, Providing text areas,Checking boxes, Choosing radio buttons, Selecting options, Uploading files **Building interfaces-** Launching a window, Responding to buttons, Displaying messages, Gathering entries, Listing options, Polling radio buttons, Checking boxes, Adding images **Developing applications-** Generating random numbers, Planning the problem, Designing the interface, Assigning static properties, Initializing dynamic properties, Adding runtime functionality, Testing the program, Freezing the program, Deploying the application.


**72: Entrepreneurship Development**

**UNIT - I**

Entrepreneurs: Introduction, Evolution of the concept of Entrepreneur, Characteristics of successful Entrepreneurs, The charms of becoming Entrepreneur, The Entrepreneurial decision process, Functions of Entrepreneur, Need of Entrepreneur, Types of Entrepreneurs, Distinction between an Entrepreneur and a Manager, Entrepreneur, social Entrepreneur Entrepreneurship: Concept of Entrepreneurship, Growth of Entrepreneurship in India, Role of Entrepreneurship in economic development. Women Entrepreneurship: Concept of women Entrepreneur, Functions of women Entrepreneurs, Growth of women Entrepreneurship in India, Problems of women Entrepreneurs, Developing women Entrepreneurship. Rural Entrepreneurship: Meaning of rural Entrepreneurship, Need of rural Entrepreneurship, Rural Entrepreneurship/ Industrialization in retrospect, Problems of rural Entrepreneurship, How to develop Rural Entrepreneurship? Tourism Entrepreneurship: Meaning of tourism Entrepreneurship, The perspective, Tourism enterprise, Entrepreneur and Entrepreneurship, Policy Measures of Tourism Entrepreneurship in India


**UNIT - II**

**Agri-Preneurship:** Introduction, Need for developing Agri-Preneurship in India, Opportunities fordeveloping Agri-Preneurship, Challenges involved in developing Agri- Preneurship. **Social**

**Entrepreneurship:** Introduction, Meaning of Social Entrepreneurship, the Perspective of Social Entrepreneurship. **Family Business:** Introduction, Manning of family business, Types of family business, family business in India: A Historical Perspective, Advantages of family business, Disadvantages of family business, Major challenges faced by family business in India. **Factors affecting Entrepreneurship growth:** Factors affecting Entrepreneurship, Government Actions.

**Entrepreneurial Motivation:** Meaning of Entrepreneurial Motivation, Motivational Cycle or Process, Theories of Entrepreneurial Motivation. **Entrepreneurial Competencies:** Meaning of Entrepreneurial Competency, Major Entrepreneurial Competencies, Developing Entrepreneurial Competencies.

## UNIT - III

**Entrepreneurship Development Programmes (EDPs):** Meaning of EDP, Need of EDPs, Objectives of EDPs, Entrepreneurship Development Programmes in India: A Historical Perspective, Course contents and curriculum of EDPs, Phase of EDP, Evaluation of EDPs, and Problems of EDPs. **Micro and small enterprises:** Small enterprise: Meaning & Definition, Micro & Macro units, Essentials, features & Characteristics, Relationship between Micro and Macro enterprises, Rationale behind Micro & small enterprises, Scope of Micro and Small Enterprises, Objectives of Micro enterprises, Enterprise & Society, Role of Micro enterprise in economic development, Quick Estimates of 4$^{th}$ All India Census of MSME, Package for promotion of Micro and Small-scale enterprise. **Opportunity Identification and Selection:** Need for Opportunity Identification and Selection, Environmental dynamics and change, Business opportunities in various sectors, Identification of business opportunity, Opportunity selection, Steps in setting up of a small business enterprise. **Formulation of Business Plans:** Meaning of business plan, Contents of business plan, Significance of business plan, Formulation of businessplan, Planning Commission's Guidelines for formulating Project report 310, Network Analysis, Common Errors in business plan formulation.

## UNIT - IV

**Project Appraisal:** Concept of Project Appraisal, Methods of Project Appraisal, and Environmental clearance of SMEs. **Financing of Enterprise:** Meaning and need for financial planning, Source of Finance, Capital Structure, Capitalization, Term Loans, Sources of short-term Finance, Venture Capital,Export Finance. **Forms of business Ownership:** Sole Proprietorship, Partnership, Company, Cooperative, And Selection of an appropriate form of ownership structure, Ownership Pattern in Micro-sale Enterprise

## 73- Practical List of Python

1.      Write a Python program to convert the given temperature from Fahrenheit to Celsius and vice versa depending upon user's choice.
2.      Write a Python program that allows the user to enter any integer base and integer exponent, and displays the value of the base raised to that exponent.
3.      Write a Python program that prompts the user for a certain number of cities for the Travelling salesman Problem, and displays the total number of possible routes that can be taken.Write a Python program th
4.      at prompts the user to enter an upper or lower case letter and displays the corresponding Unicode encoding.
5.      Write a Python program to calculate total marks, percentage and grade of a student. Marks obtained in each of the three subjects are to be input by the user. Assign grades according to the following criteria:

> Grade A: Percentage >=80
> Grade B: Percentage>=70 and <80 Grade C:
> Percentage>=60 and <70 Grade D:
> Percentage>=40 and <60 Grade E:
> Percentage<40

1.  Write a Python program to find the area of rectangle, square, circle and triangle by accepting suitable input parameters from user using user-defined function.

2.  Write a Python program to display the Fibonacci series in a given range.

3.  Write a Python program to Print and evaluate the following series. The series is -- Sum = (x)-(x^2/2!) )+(x^3/3!) )-(x^4/4!) +(x^5/5!) )- ………………..

4.  Write a Python program to calculate the subtraction of two compatible matrices.

5.  Write a Python program to calculate the addition of diagonal elements of a matrix.

6.  Write a Python program to search a given string from the list of strings using recursion.

7.  Write a Python program to calculate factorial of a given number using recursion

**Visual Python**

8. Write a Python program to create mathematical 3D objects –
    I.      curve
    II.     sphere
    III.    cone
    IV.     arrow
    V.      ring
    VI.     cylinder.

9. Write a Python program to read n integers and display them as a histogram.

10. Write a Python program to display sine and cosine curves.

11. Write a Python program to plot a graph of people with pulse rate p vs. height h. The values of p and h are to be entered by the user.

12. Write a Python program to calculate the mass m in a chemical reaction. The mass m (in gms) disintegrates according to the formula m=60/(t+2), where t is the time in hours. Sketch a graph for t vs. m, where t>=0.

13. A population of 1000 bacteria is introduced into a nutrient medium. The population pgrows as follows:
    P (t) = (15000(1+t))/(15+ e)
    Where the time t is measured in hours. Write a Python program to determine the size ofthe population at given time t and plot a graph for P vs t for the specified time interval.

14. Input initial velocity and acceleration, and plot the following graphs depicting equationsof motion:
    I.      velocity wrt time (v=u+at)
    II.     distance wrt time ( s=u*t+0.5*a*t*t)
    III.    distance wrt velocity ( s=(v*v-u*u)/2*a )

15. Write a Python program show a ball bouncing between 2 walls.

# 74- Project

## (A) Project and Classification of Marks on Project

Towards the end of the second year of study, a student will be examined in the course "Project Work".

a. Project Work may be done individually or in groups (Maximum 3 students) in case of bigger projects. However if project is done in groups, each student must be given a responsibility for a distinct module and care should be taken to monitor the progress of individual student.

b. The Project Work should be done using the tools covered in B.Com. (Computer Application) (BCCA).

c. The Project Work should be of such a nature that it could prove useful or be relevant from the commercial / management angle.

d. The project work will carry 100 marks.

e. Project Work can be carried out in the Institute or outside with prior permission of the Institute.

f. The external viva-voice examination for Project Work would be held as per the Examination Time Table of the Third year of study, by a panel of one external and one Internal Examiner.

**Types of Project**

As majority of the students are expected to work out a project in some industry / research and development laboratories / educational institutions / software export companies, it is suggested that the project is to be chosen which should have some direct relevance in day-today activities of the candidates in his/her institution. The Applications Areas of project – Financial / Marketing / Database Management System / Relational Database Management System / E-Commerce / Internet / Manufacturing / web Designing / Scientific / ERP etc.

**Project Proposal (Synopsis)**

The project proposal should be prepared in consultation with the guide. The project guide must be a person having minimum Qualification MCM / M.Sc. (Computer Science + Information Technology) / M.Sc. (Mathematics / Electronics / Statistics / Physics + Post B.Sc. Diploma in Computer Science & Application) / MCA. The project proposal should clearly state the objectives and environment of the proposed project to be

# Bachelor of Business Administration (BBA) SEMESTER-I

## 75- English

**Unit I:** Basic Grammar – Tense, Forms of the Verb, Preposition, Articles, Punctuation, Single Word for a Group of Words, Sentence Construction, Comprehension.

**Unit II:** Business Letter Writing- Enquiries and replies, Placing and fulfilling orders , Complaints and follow-up letters , Sales letters, Circular letters, Application for employment and Resume.

**Unit III:** Business Manners- Body Language, Gestures, Telephone etiquette, E-mail etiquette.
Textbook:
1) The Bet – Anton Chekov
2) Socrates and the Schoolmaster – F. L. Brayne

**Unit IV:** Textbook:
1) An Astrologer's Day – R. K. Narayan
2) The Gift of the Magi – O' Henry
3) With the Photographer – Stephen Leacock

## 76- Fundamentals of Business Management

**Unit I: Introduction** -Nature, function, definition and importance of management, Definition, nature,
purpose and scope of management, Functions of a manager, is management a science or art?
Development of Management Thought -Scientific management; Contribution of Taylor, Fayol, Mary
Follet, Elton Mayo; Hawthorne experiments, Contingency approach.

**Unit II: Management and Administration**-Management and administration, Management as a profession, Professionalism of management in India, Management ethics and management culture, Skills required of manager, Classification of skills, Methods of skills development.

**Unit III: Management Planning**-Concept of planning, objectives, Nature, Types of plan, Stages involved in planning, Characteristics of a good plan, Importance, Limitations of planning, Making planning effective, Strategic planning in Indian Industry.

**Unit VI: Decision Making**-Concept, characteristics of decisions, Types of decisions, Steps Involved in decision making, Importance of decision making, Methods of decision making, Committee Decision
Making. Organisation -Concepts, Principle of organization, Importance, Features of good organization
structure, Types of Organisation structure.

## 77- Computer Applications for Business

**Unit I: Introduction to Computers** - Generation of Computers, Block Diagram, Working of Computer, Hardware and Software, Programming and Flow Charts concepts, Operating systems (MSDOS, Windows, UNIX, Linux), Networking concepts.

**Unit II: Working with Computers** - Introduction to Word, Excel, PowerPoint, Internet,. Lab Activity would be based on the following topics: a. MS Word b. MS Excel c. MS PowerPoint

**Unit III: Introduction to e-Commerce**, e-Learning and e-Business, M-Commerce. Introduction to Basic Web Page designing Language (HTML), using Tags: - Structural, Formatting, List tags and Table.

**Unit IV: IT Consulting** – Basic concepts of business, strategy and operation; Business / Strategic Consulting: Reengineering, BPR; Operations Consulting: domain knowledge concept domainconsulting. IT Enabled Services (ITES) – Processes, Outsourcing Function, Call Centres; BPO's: Captive BPO's (GE and Dell) and Third Party BPO's (Infosys BPO, Wipro BOP, Mphasis, Daksh and EXL etc).

## 78- Cost Accounting

**Unit –I: Introduction -**Meaning of Cost, Costing and Cost Accounting, Features, Scope and Functions of Cost Accounting, Advantages and Limitations of Cost Accounting; Concept of Cost; Analysis and
Classification of Costs; Elements of Cost; Preparation of Cost Sheet (Statement of Cost); Quotations and tender. Introduction and need for reconciliation between financial accounts and cost account, reasons for disagreement in Profit; Preparation of Reconciliation Statement.

**Unit –II: Process Costing:** Meaning, features and applicability, difference between process and job costing, wastage and by-products, normal and abnormal loss. Preparation of process accounts

**Unit III: Operating Costing:** Classification of costs, Features of operating costing: Transport costing
(Standard charge, running and operating cost, maintenance charges and log sheet)

**Unit IV Marginal Costing:** Introduction, Application of Marginal costing in terms of cost control, level of activity planning- Break-even-analysis: Application of BEP for various business problems.

# Bachelor of Business Administration (BBA) SEMESTER-II

## 79- Principles of Marketing Management

**Unit I Marketing :**Definition, nature, scope & importance, MarketingManagement, Core concepts of marketing, selling concept,production concept, modern marketing concept.

**Unit II Segmentation:** Concept, basis of segmentation, Importance inmarketing; Targeting : Concept
Types, Importance; Positioning: Concept, Importance, Brand positioning, Repositioning.

**Unit III Marketing Mix:** Product : Product Mix, New Product development, levels ofproduct, types of product, Product life cycle, Branding andpackaging, different types of distribution channels.

**Unit IV Price:** Meaning, objective, factors influencing pricing, methods of pricing.Promotion : Promotional mix, tools, objectives, media selection & management. Process & Scope Marketing **Information Systems :** Meaning Importance and Scope Consumer Behaviour : Concept, Importance and Factors influencing consumer behaviour.

## 80- Financial & Management Accounting

**Unit –I: Introduction -** Meaning, Scope and importance of Financial Accounting. Financial Accounting - concepts and conventions, classification of accounts, Rules and principles governing Double Entry Bookkeeping system (Preparation of Journal), Nature and function of financial Reporting, GAAP.

**Unit –II: Final Accounts of Companies -** Final Accounts of Joint Stock Companies – contents and preparation of Trading and Profit and Loss Account, Profit and Loss Appropriation Account and Balance sheet with adjustment, Closing Entries (Simple entries)

**Unit III: Management Accounting** - Meaning, Scope, Importance, and Limitations of Management
Accounting, Difference between Financial Accounting and Management Accounting, Break even analysis, Analysis of Financial Statements (using ratio analysis-simple ratios)

**Unit IV: Budgetary Control** - Business budgets and budgetary control – Types of budget and its utility, preparation of cash & flexible budgets.

## 81- Micro-Economic Fundamentals

**Unit I: Introduction to Micro Economics-** Meaning, Definition, Importance of Micro Economics, Factors affecting Micro Economics. Difference between Micro-Economics & Macro Economics.

**Unit-II Demand and Supply Analysis -** Concept of Demand, Law of Demand-Meaning, Definition,Assumptions & Exceptions. Elasticity of Demand- Meaning, Types and Factors affecting Elasticityof

Demand; The Indifference Curve Theory; Supply- Concept of Supply, Elasticity of Supply, Types and Factors affecting Elasticity of Supply.

**Unit III: Production & Cost Analysis -** Production & Production Function: Concept, Forms of Production function, Law of Variable Proportions, Returns to scale. Cost Concepts, Short term and Long term cost output relationship, The Isocost and Isoquant Approach, Economic Region and Economies & Diseconomies of scale.

**Unit IV: Market Structures**- Characteristics and price determination in various market structures Perfect Competition, Monopoly, Monopolistic Competition, Oligopoly. Pricing: Meaning, Types of Pricing.

# 82– English

| | | | |
|---|---|---|---|
| 1 | Unit I | Basic Grammar& Vocabulary :<br><br>• Subject-Verb-Agreement / Concord of Nouns, Pronouns and Possessive Adjectives<br><br>• Spotting errors and rewriting sentences correctly.<br><br>• Phrasal Verbs, Collocations and Idioms (based on the exercises at the end of the prescribed lessons from *Golden Harvest*<br><br>• Words Often Confused | Reference Books:<br><br>1. Macmillan Foundation English by R. K Dwivedi and A. Kumar (Macmillan/Trinity)<br><br>2. Learners' English Grammar and Composition by N. D. V. Prasad Rao (S.Chand Publication)<br><br>3. Developing Communication Skills by Krishna Mohan and MeeraBanerji ( Trinity) |
| 2 | UNIT II | Business Communication<br>• Memorandum Writing<br>• Notice, Agenda and Minutes<br>• Writing Advertisements for: Rent, Sale, Situations Vacant | 1. Developing Communication Skills by Krishna Mohan and MeeraBanerji ( Trinity)<br><br>2. Write Right by SaritaManuja (Macmillan/ Trinity) |
| 3 | UNIT III | Prose Items:<br>• A Real Good Smile: Bill Naughton<br>• What India Inc Wants:<br>  a. Our Muddled Generation: Dinesh Kumar<br>  b. Employers Look for Potential Employees, not Exam Results: Manish Sabharwal<br>• The Thief: Ruskin Bond | Prescribed text : *Golden Harvest* by Orient BlackSwan |

| 4 | UNIT IV | Prose Items: <br> &bull; A Simple Philosophy: Seathl <br> &bull; Go, Kiss the World: SubrotoBagchi <br> &bull; My Struggle for an Education: Booker T. Washington | Prescribed text : *Golden Harvest* by Orient BlackSwan |
| --- | --- | --- | --- |

# Bachelor of Business Administration (BBA) SEMESTER-III

## 83- Principles of Financial Management

**Unit –I: Introduction of Business Finance -** Meaning, Scope and importance of Business Finance. Finance Functions. Goals & objectives of financial management

**Unit –II: Sources of Financing -** LONG TERM: Equity shares, Preference Shares, debentures,/ Bonds
(Types, features & utility), term loans, lease & hire purchase, retained earnings,; SHORT TERM: trade credit, bank finance, commercial paper, factoring & bills discounting.

**Unit III: Cost of Capital -** Cost of capital, Cost of different sources of finance, weighted average cost of capital, Concept of Leverage, Concepts of Capital Structure.

**Unit IV: Working Capital Management** - Meaning, Scope, Importance, and Limitations of Working
Capital, Factors affecting Working Capital needs, Various Approaches for financing Working Capital.
Concept of Operating Cycle, Estimation of Working Capital Requirement.

## 84- Basic Statistical Techniques

**Unit I** – Definition, functions, scope and role of statistics in business and importance of statistics. Classification of data, tabulation, frequency distribution, diagrams & graphs.

Unit **II** – Importance and requisites of a good statistical average, types of averages – arithmetic mean, median, mode, geometric mean, harmonic mean, weighted average, relationship amongst different averages.

**Unit III** – Meaning and significance of dispersion, methods of measuring dispersion – range, quartile deviation, mean deviation, standard deviation and coefficient of skewness.

**Unit IV** – Definition of correlation, significance of correlation, types of correlation, merits and limitations of coefficient, Calculation of coefficient of correlation and probable error for simple series, calculation of coefficient of correlation and probable error for continuous series.

## 85- Evolution of Business & Commercial Geography

**Unit I**–Evolution of Business & Economy: Industrial revolution (1820-1850); Rise of European business (1850-1900); Impact of First World War on International Business; The Great Depression and its effect on International Business; Impact of Second World War on International Business.

**Unit II –** Evolution of Business in post WWII Scenario: Cold War and its impact on International Business; OPEC Crises and its impact on International Business; Gulf War and its impact on International Business; Dawn of IT era and its impact on business & economy.

**Unit III – Commercial Geography:** Geography - meaning & its relation with Commerce & Commercial Geography - Nature and scope. Approaches of commercial Geography. 2.

Geographical Environment & Commerce - Relationship between geographical environment and Commerce, Economic activities, Determinism and possibilism, Physical environment - Location, size and shape of the country relief, climate, water bodies, soils, vegetation, animals, minerals, Cultural environment, settlements, transport, communication and technology.

**Unit IV -Industries :** Role of industries in Economic development; Factors of industrial location – Raw material, power, market, transport and communication, land capital, technology; Webers theory of industrial location, Iron & steel industry - India & USA, Cotton textile industry - India & USA.
Engineering industry in India - Major industrial regions of the world and India.

## 86- Environment Management

**Unit I: Introduction to Environment Management:** Definition, Scope importance, Need for public awareness, sustainable development, Natural Resources- renewable and non- renewable resources, role of individual in conservation of natural resources( Forest, water, land, energy, mineral)

**Unit II: Environment Pollution:** Types of pollution- air, water, soil, noise, thermal and Nuclear, causes effectsna control measures, Global warming, green house effect, Ozone layer depletion, Acid rains

**Unit III: Human Population:** Global population growth, variations among nations, Population explosioncauses and impact, Family welfare Programs-methods of sterilization; Infectious diseases, water related diseases, risk due to chemicals in food, Cancer and environment

**Unit IV: Social Issues in Environment:** Construction of dams: problems and concerns of resettlement, rehabilitation of affected people; Environmental ethics– issues and possible solutions, resource consumption patterns and need for equitable utilization; Equity disparity in western and eastern countries; Urban and rural equity issues; Need for gender equity.

# Bachelor of Business Administration (BBA) SEMESTER-IV

## 87- Principles of Human Resource Management

**Unit 1 : Introduction to Human Resource Management:** Definition, concept and Scope of H. R. M., Difference between Personnel Management and H.R.M., Importance and Functions of H.R.M. Role of H.R Department.

**Unit 2 : Job Analysis, Job Design:** Meaning of Job Analysis, Uses, Process and methods of collecting data for job analysis, Job Description, Job Specifications. Meaning of Job Design, Techniques of Job Design

**Unit 3 : Human Resource Planning - Recruitment – Selection:** Definition and objectives of Human
Resource planning, process of Human Resource planning factors influencing estimation of Human Resources, Concept of Recruitment & Selection, sources of recruitment, Selection Procedure

**Unit 4 : Induction & Training :** Concept of Induction, Training- Need for training, benefits of training, identification of training needs and methods/ types of training. Evaluation of effectiveness of training programs.Placement, Transfer, Promotion, Demotion.

## 88- Money, Banking & Finance

**Unit I: Money -** Concept and functions of Money, Origin and development of Money, Limitations of
Barter System, Classification of Money, Importance of Money, Qualities of Good Money, Defects of money.

**Unit-II – Banking and Finance -** Commercial Banking- Role and functions of Commercial Banks, Credit creation and its limitations Central Banking-Functions of Central Bank. Reserve Bank of India –Role in Indian Economy, Monetary & Non-Monetary functions of RBI.

**Unit III: National Income Determination-** Meaning, Method & Difficulties of Measuring National
Income; Concept of GDP, GNP, NNP, PI, DPI. Inflation and Deflation- Types, Causes and Measures to Control.

**Unit IV: Monetary and Fiscal Policy-** Concept, Objectives, Instruments, Limitations of Monetary and Fiscal policy, Public Finance- Meaning, Scope and Importance of Public Finance, Public Finance Vs Private Finance.

## 89- Introduction to Sociology & Psychology

**Unit I:Sociology as the Science of Society:** (a) Sociology – Meaning and Definitions, (b) Characteristics of Sociology as a science (empirical, theoretical, cumulative and nonethical), (c) Development of Modern Industrial Society – Characteristics, industrialism, capitalism, urbanism,

liberal democracy, (d) Postmodern Society – Nature and Characteristics, (e) Culture – Meaning and elements, (cognitive elements, beliefs, values and norms and signs), Meaning, stages and agencies of socialisation.

**Unit II: Structure and Social Change:** (a) Structural aspects of social system – Institutions, groups, subgroups, roles, norms and values, (b) Social change – Its sources – Internal and External, (c) Types of Social Change – Changes in social values with reference to pattern variab les, changes in occupational structure and demographic changes

**Unit III: Introduction to Psychology:**(a) Definition, Nature, Scope and Applications of Psychology.
(b)Methods: Introspection, Observation, Experimental, Interview, Questionnaire and Case Study.
(c)Contemporary Perspectives: Biological, Cognitive, Psychoanalytical, Humanistic, Evolutionary and
Cross-cultural. (d)Biological Bases of Behaviour: Evolution, Genes and Behaviour. The Response Mechanism: Receptors, Effectors and Adjustors. (e)The Nervous System: The Basic Structure, Functions and Divisions of the Peripheral and Central Nervous System.

**Unit IV:Social Psychology:**(a)Introduction: Nature and Scope; Methods of Studying Social Behaviour: Observation, Experimental, Field Study, Survey, Sociometry and Cross-cultural. (b)Socialization: Agents and Mechanisms, Socialization and Deviation. (c)Perceiving Others: Forming Impressions; Role of Nonverbal Cues, Group stereotypes, Central Traits; Primary and Recency Effects; Models of Information Integration; Attribution of Causality: Biases and Theories (Jones and Davis, Kelley).

## 90- Business Legislations

**Unit I: Administration of law & legal system in India** - Introduction to legal aspects of Business in general; Freedom of Trade, Profession and Occupation (Constitutional Provisions).

**Unit II: Indian Contract Act (1872)** - a) Definition (Sec.2) b) Essential elements of a valid contract c) Competency to enter in contracts (Sec. 11 & 12).d) Consent – Free consent, Coercion, undue influence, fraud, misrepresentation, mistake (sec 13-23).Void Agreement (sec 24-30) f) Consequences of breach of contract (sec73-75).

**Unit III: The Companies Act (1956)** - Definition & characteristics of a company, Company distinguished from partnership, Kinds of Companies, Provisions relating to incorporation, lifting the Corporate Veil. Memorandum of Association, Doctrine of ultra-vires, Articles of Association, Doctrine of indoor management & constructive notice, Concept of Prospectus. Company Management And Board Meeting : Administrative Hierarchy, Board of Director – Director- Legal Position, Appointment, Qualification, Disqualification, Removals Power, duties, Liabilities etc. Managing Director – Meaning, Appointment, and Disqualification. ManagerMeaning, Disqualification. Company Meetings Meaning of meeting- General Body meeting – statutory Meeting, Annual General meeting, Extra ordinary meeting Board Meeting.

**Unit IV: The Consumer Protection Act,1986** Salient features of Act. Definitions- Consumer, Complaint, Services, Defect and Deficiency, Complainant. Rights and Reliefs available to consumer. Procedure to file complaint. Consumer Disputes Redressal Agencies.(Composition, Jurisdiction, Powers and Functions.) Procedure followed by Redressal Agencies. Introduction to GST.

# Bachelor of Business Administration (BBA)
# SEMESTER-V

## 91 - Entrepreneurship Development

**Unit I: Entrepreneur & Entrepreneurship:** Evolution of the concept of Entrepreneurs, Characteristics of an Entrepreneur, Distinction between an entrepreneur and a manager; functions of an entrepreneur, types of entrepreneurs, concept of intrapreneurs; growth of entrepreneurship in India, role of entrepreneurship in economic development.

**Unit II: Entrepreneurial growth: Factors** - Economic factors, non-economic factors, Government actions; Entrepreneurial competencies – meaning, major competencies, developing competencies; Entrepreneurship Development Programs (EDPs) - Need, objectives, course content of EDPs, phases of EDPs, evaluating EDPs. Unit III: Business Idea - Identifying & Developing Entrepreneurial Potential, Business Ideas Generation Process, Evaluation of Business Idea.

**Unit III: Small Enterprises:** An introductory framework: Definition, characteristics, relationship between small and large units, rationale, objectives, scope, opportunities for entrepreneurial career, problems of  SSIs; Project Identification and Selection (PIS) - Meaning of project, project identification, project selection, contents of project reports, formulation of project reports; Project Appraisal - Concept, methods, economic analysis, financial analysis, market analysis, technical feasibility, managerial competence.

**Unit IV: Institutional & financial support to Entrepreneurs** Need for institutional support, various institutions supporting entrepreneurship in India – MIDC, MSME, MCED, DIC, SSIB, MSSIDC, BIFR; Financial support to entrepreneurs: Commercial banks, other  financial institutions – IDBI, IFCI, SFCs, SIDBI, venture capital.

## 92-Principles of Operations Management

**Unit I: Introduction to Operations Management:**
Introduction to Operations Management, its Nature, Scope, Importance and Functions. Difference between production, manufacturing and service. Concept and types of production, mass, job-based, batch and assembly line production system. Types of services

**Unit II: Facilities and Production Planning :** Factors affecting plant location, types of plant layouts – product layout, process layout, fixed position layout, cellular layout, types of service layouts. Concept of production planning, definitions of capacities, master production schedule, material planning. Introduction to maintenance

**Unit III: Material Management:** Scope of materials management, Purchase and Stores Functions, Introduction to warehouse management, Concept of Lead time, re-order level, minimum and maximum stock, Basic concepts of Inventory management, inventory costs, ordering and carrying cost.

**Unit IV: Quality Management and Productivity:** Introduction to quality, dimensions of quality, concept of product, process and service quality. Introduction to Quality Management System, concept of TQM, ISO, Kaizen, Quality circles, Six-sigma.Concepts of productivity, machine, labour and cost productivity.

## 93- International Business

**Unit I: Introduction to International Business:** Importance, nature and scope of International business; Modes of entry into International Business; Internationalization process and managerial implications; Issues in foreign investments, technology transfer, pricing and regulations; International collaborative arrangements and strategic alliances; Concept and significance of balance of payments account.

**Unit II: International Business Environment: Economic:** Political, Cultural and Legal environments in International Business. Framework for analyzing international business environment.

**Unit III: Global Trading and Investment Environment:** World trade in goods and services – Major trends and developments; World trade and protectionism – Tariff and non-tariff barriers; Foreign Investments-Pattern, Structure and effects; Movements in foreign exchange and interest rates and their impact on trade and investment flows.

**Unit IV: International Economic Institutions and Agreements**: WTO, WTO and Developing Countries, IMF, World Bank, UNCTAD, International commodity trading and agreements. Structure and functioning of EC and NAFTA, Regional Economic Groupings in Practice: Levels of Regional Economic Integration; Regionalism vs. Multilateralism; Important Regional Economic Groupings in the World.

## 94-Research Methodology

**Unit I: Introduction -** Meaning, Objectives and Types of research, Research Approach, Research Process, Relevance & scope of research in management. Research Design - Features of good Design, Types of Research Design.

**Unit II: Sampling Design** - Steps in sample Design, Characteristics of a good sample Design, Probability & Non-Probability sampling. Hypothesis – Meaning, Types, Process, Formation of Hypothesis, Testing of Hypothesis

**Unit III: Measurement & scaling techniques** - Errors in measurement. Test of sound measurement, Scaling and scale construction technique. Attitude Measurement and Scales: Introduction to attitude - Various Methods to measure attitude.

**Unit IV: Methods of data collection** - Primary data – questionnaire and interviews; Collection of secondary data. Interpretation of data - Techniques of Interpretation, Report writing, Layout of a project report, preparing research reports

# Bachelor of Business Administration (BBA) SEMESTER-VI

## 95-Elective C– Marketing Management– Fundamentals of Marketing Management

**Unit – I: Integrated Communication Mix (IMC)** -meaning, importance; Communication meaning, importance, process, communication mix-components, role in marketing,

**Unit – II: Branding** - meaning, brand recall, brand positioning. Importance of branding and advertising. Digital Marketing – Scope and Importance, Search Engine Optimization (SEO), Out of home (OOH).

**Unit – III: Sales Organization and Relationship:** Purpose of sales organization, Types of sales organization structures, Sales department external relations, Distributive network relations.

**Unit – IV: Concept of services -** Nature & characteristics of services, Marketing Mix and strategies in Service Marketing, Product decisions, pricing strategies, Promotion of services, Placing or Distribution methods of services, Service vision & Strategies: Includes Advertisements, Branding, Packaging of Services.

### 96- Advanced Marketing Management

**Unit – I : Sales Management :** - Evolution of sales function, Objectives of sales management positions, Functions of Sales executives, Relation with other executives, Salesmanship : Theories of personal selling, Types of Sales executives, Qualities of sales executives, Prospecting, reapproach and post-approach, Organizing display, showroom & exhibition.

**Unit – II: Distribution network Management**: Product Distribution Channel & Types of Marketing Channels, Factors affecting the choice of channel, Types of middleman and their characteristics, Wholesale and Retail, Supply Chain Management (SCM) and introduction to Supply Chain Management, Various types of Warehousing and transportation facilities.

**Unit – III: Service Quality** - Impact of service Quality, Approaches to service Quality, Ten original dimensions of Service Quality, How to improve service Quality, Service quality information systems, Benchmarking and certification. Marketing challenges in services business; Classification of services; End user, Profit orientation, Services tangibility, People based services, Expertise. Role of IT in service industry.

**Unit – IV: Customer Retention & Relationship Marketing:** CB-Services, Facts & Importance of CB in services, Evolution of Relationship Marketing, Enhancement of Internal & External relationships, Customer Retention (Operations, Delivery System). Various types of services offered to customers – hotel, hospital, transport, insurance, banking and education

# 97-Project Work

### Objective

Every student will be assigned a project in 6th Semester of BBA and it will be pursued by him/her under the supervision of an internal supervisor. The objective of the Project Work is to help the student develop his/her ability to apply multi-disciplinary concepts, tools and techniques to solve organizational problems and/or to evolve new/innovative theoretical frame work.

### Type of Project

The Project may take any one of the following forms:

i) Comprehensive case study (covering single organization/multifunctional area problem, formulation, analysis and recommendations)

ii) Inter-organizational study aimed at inter-organizational comparison/ validation of theory/survey of management services.

iii) Evolution of any new conceptual / theoretical framework.

iv) Field study (Empirical study).

v) Software analysis, Design and solutions for organizational achievement ( Applicable to IT)

### Selection of Project Topic:

- Project topic has to be selected with respect to the programme of study and area elected by the student.
- Title of the project should clearly specify the objective and scope of the study. It should be specific and neither too vague nor centralistic. The topics should be designed meticulously. It can be designed like "Employee Welfare Measures" – A case study of XYZ Ltd.
- Project selection has to be made in consultation with the supervisor who will act as a Project guide for the student.

### Scope of Work

The student is expected to carry out following activities in the project:

1. Prepare a synopsis and get it approved by the supervisor as assigned by the respective Institutes.
2. Undertake a detailed literature survey on the subject matter.
3. Make relevant data collection/observation.
4. Consult experts of the field.
5. Visit related organizations/institutions/industries.
6. Compile data in proper format.
7. Make proper conclusion/recommendations.
8. Prepare a Project Report.
9. The volume of the project-report should be ranging from 60-80 pages.
10. Obtain approval of Project Report by project supervisor.
11. Submit two hard bound copies of the Project Report at the Institute.
12. Submission of the Project Report shall be one month prior to the date of the commencement of the 6th Semester Examinations for BBA.

### General Format of the Report

The project report should preferably be written in the following format:

a) Executive Summary

b) Introduction to topic

c) Research Methodology

d) Analysis and Findings of the study

e) Conclusions and Recommendations of the study

f) Bibliography

g) Appendices – to include questionnaire, if any

# Bachelor of Computer Application (BCA) SEMESTER-I

**98- English**

### Unit I - Prose Lessons

1. The House
2. The Boy Who Broke The Bank
3. Parveen
4. The Selfish Giant

### Unit II - Poems

1. Eyes Immortal
2. Elegy Written in a Country Churchyard
3. Ulysses
4. Ecology

### Unit III - Grammar

1. Tenses
2. Voice
3. Prepositions

### Unit IV – Composition, Comprehension & Vocabulary

1. Letter Writing
2. Comprehension
3. Synonyms and Antonyms

**99– Marathi**

## Syllabus

ss : B.SC (IT), B.C.A. I$^{ST}$ SEM.     Subject : MARATHI
'शब्दगंध'

| Unit | Particulars | From | To |
|------|-------------|------|-----|
| 1 | वर्तमानकालीन सामाजिक, पर्यावरण विषयावर आधारित निबंध (दोन पैकी एक) | ⑫ गुण | |
| 2. | गद्य विभाग | ⑮ गुण | |
| | १) शेतकऱ्यांविषयी – म. जोतीबा फुले | | |
| | २) स्टीमरमध्ये – म. गांधी | | |
| | ३) विज्ञान थाप की वरदान – द. के. केळकर | | |
| | ४) ज्ञान – साने गुरूजी | | |
| | ५) स्वंडेरावचं संशोधन – भालचंद्र नेमाडे | | |
| ३. | पद्य विभाग | ⑮ गुण | |
| | १) दुरितांचे तिमिर जावो – संत ज्ञानेश्वर | | |
| | २) वृक्षवल्ली आम्हां सोयरे – संत तुकाराम | | |
| | ३) आम्ही कोण ? – केशवसुत | | |
| | ४) कशाला पंढरी जातो ? – राष्ट्रसंत तुकडोजी महाराज | | |
| | ५) आहे बुद्धीसी स्मान – बा. सी. मर्ढेकर | | |
| 4. | १) म्हणींचा अर्थ सांगून वाक्यात उपयोग करा | ⑬ गुण | |
| | २) सारांश | ⑭ गुण | |
| | ३) कार्यालयीन पत्र | ⑭ गुण | |
| | ४) इंग्रजीच्या उताऱ्याचे मराठीन भाषांतर करा. | ⑭ गुण | |
| | ५) शुद्धलेखन | ⑭ गुण | |

**100– Hindi**

<div align="center">

बी.एस.सी.प्रथम वर्ष
पाठ्यक्रम हिन्दी (प्रथम सेमिस्टर)
(बी.सी.ए / बी.एस.सी.आईटी)

</div>

समय. 03घण्टे                                             पूर्णांक : 60

निर्धारित पाठयपुस्तक                          साहित्य सरीता
                                   सम्पादक –जोगेन्द्रसिंह बिसेन
                                   प्रकाशक–ओरियंट ब्लैकस्वॉन

प्रथम इकाई :(अ) निबंध :– समसामायिक विषय              15
          (ब) मुहावरे

द्वितीय इकाई : गद्य (1) ईदगाह                         15
             (2) गुण्डा
             (3) परदा
             (4) जिंदगी और जोंक
             (5) मै हार गई

तृतीय इकाई :  पद्य (1) तोडती पत्थर                     15
             (2) कालीदास से
             (3) कहाँ तो तय था चिरागॉ
             (4) रोटी और संसद
             (5) मारे जायेंगे

चतुर्थ इकाई :  पत्राचार (पत्रों के प्रकार)             15
             (अ) (1) कार्यालयीन पत्र
                 (2) व्यावसायिक पत्र
                 (3) व्यावहारिक पत्र
                 (4) आवेदन पत्र
             (ब) नौकरी हेतु आवेदन पत्र

**101- Supplementary English**

**Unit I : Prescribed Text**: **Understanding India** Edited by B. Keralavarma (Macmillan)
The following essays from the prescribed Text:
5. Brother Abdul Rahman – Amarlal Hingorani
6. Gandhi and the Western World - Louis Fischer
7. The Cow of the Barricades – Raja Rao
8. The Smaller Gandhis – Mohinder Singh Sarna

**Unit II : The Old Man and the Sea** by **Ernest Hemingway (Duttsons)**

**Unit III: Vocabulary Expansion**
(Some Common Foreign Words Used in English, One Word for a Group of Words, Idioms and Phrases)

**Unit IV: a) Expansion of an Idea**
**b) Word-formation Rules**
(Noun Forms of Some Adjectives, Noun Forms of Some Verbs)
**c) Precis Writing**

## 102- COMPUTER FUNDAMENTALS

**UNIT - I :**
**Basic Components of Digital Computers:** Block Diagram**. CPU:** Functions of Each Unit: Primary Memory, ALU and CU, Instruction format. **Bus**: Data, Control and Address Bus **NumberSystems:** Binary, Octal, Decimal, HexaDecimal, Their Conversions, Binary Arithmetic. ASCII, BCD, EBCDIC**.**
**Language Evolution :** Generation of Languages : Machine, Assembly, High Level Languages. Characteristics of Good Language **Translators :** Compiler, Interpreter and Assembler. Source and Object Program.

**UNIT - II :**
**Memory:** Static & dynamic, RAM, ROM, PROM, EPROM, EEPROM, flash and Cache.
**Storage Devices**: Hard Disk, Zip Disk and Optical Disk. Pen Drive, Blue Ray

**UNIT - III :**
**Input Devices:** Keyboard, Mouse, Light Pen, Touch Screen, Voice Input , MICR, OCR, OMR, Barcode Reader and Flatbed Scanner.
**Output Devices:** VDU, Printers: Dot Matrix, Laser and Inkjet.
Plotters: Drum, Flat-Bed and Inkjet.

**UNIT - IV :**
**Network:** Network terminology, Topologies : Linear, Circular, Tree and Mesh. Types of Networks: LAN, WAN, MAN. Repeaters, Bridge, Routers, Brouters and Gateway. Modem for Communication between pc's, wi-fi network, Introduction of Bluetooth and Infrared devices. Network protocols. Architecture **:** Peer-to-Peer, Client/Server.

### 103- 'C' PROGRAMMING

**UNIT- I** :
**Programming Structure :** Sequence, Selection, Iteration and Modular. **Problem Solving techniques**: Development Tools**:** Algorithm, Flowcharts and Pseudo code (Definition and its characteristics) **Developing Algorithm and Drawing flowcharts**

**UNIT- II :**
C Character set, Tokens, Identifier, Keywords, Variables**,** Data types, Qualifiers. Operators and Expressions: Arithmetic, Relational, Logical, Bit-Wise, Increment, Decrement, Conditional and Special operators. typedef, Type Conversion, Constants, Declaring Symbolic Constants, Character Strings, Enumerated Data Types, Operator Precedence and Associativity. Library functions. : Maths, string handling Functions. Control Structure: Compound Statement, Selection Statement: if, if-else, Nested if, switch. Iteration statement: for, while, do..while, Nested loops, Jump statement: break, continue, goto. (Special emphasis on problem solving)

**UNIT- III** :
**Arrays**: Need, Types: Single and Two Dimensional Array.
**Strings**: Strings Manipulation, Arrays of Strings, Evaluation order
**Function:** Function Components, Return Data type, Parameter Passing, Return by Reference, Default Arguments, Recursive Functions, Arrays with Functions, Storage Classes. (Special emphasis on problem Solving )

**UNIT- IV**:
**Structure:** Declaration, Definition, Accessing structure members, Initialization, Nesting of Structures.
**Union**: Unions, Differences between Structure and Union
**Pointer:** Introduction, Address Operator (&), Pointer variables, Void pointers, Pointer Arithmetic, Pointers to Pointers.
**File handling:** Hierarchy of File Stream Classes, Opening & closing a file, Testing for errors, File Modes, File pointers and their manipulations, Sequential Access, Random Access, Command Line arguments.

## 104- STATISTICAL METHODS

**UNIT- I**:
Introduction - Definition of Statistics, Importance and scope of Statistics, Limitations of statistics, Distrust of Statistics. Statistical Data Collection - Primary and Secondary data, Methods of Collecting Primary data, Sources and Secondary Data, Census and Sample Investigation. Presentation of statistical Data - Classification, Tabulation, Frequency Distribution, Diagrams and Graphs. Frequency Distributions

**UNIT- II** :
Measures of Central Tendency - Frequency Distribution, Continuous Frequency Distribution, Graphic Representation of a Frequency Distribution Average or Measures of Central Tendency or Measures of Locations, Requisites for an ideal Measure of Central Tendency Arithmetic: Mean Median, Mode, Geometric Mean and Harmonic Mean, Weighted Average, Relationship amongst different Averages.

### UNIT- III:
Measures of Dispersion, Skewness and Kurtosis - Meaning and Significance of Dispersion, Methods of Measuring Dispersion - Range, Quartile, Mean Deviation, Standard Deviation, Coefficient of Skewness, Kurtosis, Coefficient of Dispersion, Coefficient of Variation.

### UNIT- IV:
Correlation and Regression - Definition of Correlation, . Scatter Diagram, Karl Pearson Coefficient of Correlation, Limits for Correlation Coefficient, Definition of Regression, Lines of Regression, Regression Curves, Regression coefficients, properties of Regression coefficients, Correlation Analysis vs. Regression Analysis.

## 105- DISCRETE MATHEMATICS – I

### UNIT- I:
Propositional Calculus:
Connectives, Negation, conjunction, Disjunction, statement formulas and truth tables, conditional and Bi-conditional, well formed formulas, Tautologies, Equivalence of formulas, duality law, Tautologies implications, Functionally complete set of, other connectives,

### UNIT- II:
Disjunctive normal forms, connective normal forms, Principal disjunctive normal form, Principal conjunctive normal form.

### UNIT- III:
Predicate Calculus:
The theory of Inference for statement Calculus, validity using truth tables, Rules of inference, consistency of premises and indirect method of Proof

### UNIT- IV:
The statement function, variables and quantifier, Predicate formulas, Free and Bound variables, The universe of Discourse, Theory of inference for predicate calculus.

## 106- OPERATING

## SYSTEMSUNIT - I:
Structure of Operating System, Operating System functions, Characteristics of Modern OS.
**Process Management**: Process states, Creation, Termination, Operations on Process, Concurrent process, Processes Threads, Multithreading, Micro Kernels
**CPU Scheduling**: Schedulers, Scheduling Methodology, CPU Scheduling Algorithm: FCFS, SJF, RR, Priority Scheduling.

### UNIT – II:
Performance comparison : Deterministic Modeling , Queuing analysis, Simulators.
**Deadlock and Starvation:** Resource Allocation Graph, Conditions for Dead Lock, Dead Lock Prevention, Dead Lock Detection, Recovery from Deadlock.

### UNIT - III:
**Memory Management:** Logical Vs. Physical Address Space, Swapping, Memory Management Requirement, Dynamic Loading and Dynamic Linking, Memory Allocation Method: Single

Partition allocation, Multiple Partitions, Compaction, paging, segmentation, Segmentation with paging. Protection.

**UNIT - IV:**
**I/O Management**: I/O hardware, I/O Buffering, Disk I/O, Raid, Disk Cache. **File Management:** File

Management system, File Accessing Methods, File Directories, File Allocation Methods, File Space Management, Disk Space Management, Record blocking. **Protection Mechanisms**: Cryptography, Digital Signature, User Authentication.

## 107- OFFICE AUTOMATION

### UNIT – I
Introduction to windows Operating System
Advantages of windows operating system, using different windows applications simultaneously, operating with windows, GUI, use of help features, starting an application, essential accessories, creating shortcuts, windows explorer, control panel, my computer, my documents, recycle bin, finding folders and files, changing system settings, system tools, use of run command, setting peripherals, drivers, editing graphics in windows, new features in windows XP/Vista versions.

### UNIT - 2
Introduction, basics, starting Word, creating document, parts of Word window, mouse and keyboard operations, designing a document; Formatting- selection, cut, copy, paste; Toolbars, operating on text; Printing, saving, opening, closing of document; Creating a template; Tables, borders, pictures, text box operations; Mail Merge.

### UNIT - 3
Introduction to MS EXCEL, navigating, Excel toolbars and operations, Formatting; copying data between worksheets; entering formula, chart creation; data forms, data sort; Functions in ExcelROUND( ), SQRT ( ), MAX( ), MIN( ), AVERAGE( ), COUNT( ), SUMIF( ), SUMIF( ), ABS( ), ROMAN( ), UPPER( ), LOWER( ), CELL( ), TODAY( ), NOW( ).

### UNIT – 4
Introduction to MS POWER POINT Working with Power Point Window, Standard Tool Bar, Formatting tool bar, Drawing tool Bar, Moving the Frame, Inserting Clip Art, Picture, Slide, Text Styling, Send to back, Entering data to graph, Organization Chart, Table,Design template, Master Slide, Animation Setting, Saving and Presentation , auto Content Wizard.

**108- Practical-I Practical-I Based on Paper I &II**

**109- Practical-II Practical-II Based on Paper III &IV**

**110 - Practical-III Practical-III Based on Paper V &VI**

# Bachelor of Computer Application (BCA) SEMESTER-II

**111- English**

### Unit I - Prose Lessons

1. Maintaining Democracy
2. The Verger
3. Two Gentlemen of Verona
4. Freedom at Midnight

### Unit II - Poems

1. Where the Mind is without Fear
2. My Last Duchess
3. Up Hill
4. The Village Schoolmaster

### Unit III - Grammar

1. Subject-Verb Agreement
2. Transformation of Sentences
(Interchange of Degrees of Comparison, Affirmative and Negative Sentences, Interrogative and Assertive Sentences, Exclamatory and Assertive Sentences)
3. Exercises on Common Errors

### Unit IV – Comprehension & Composition

1. Comprehension
2. Curriculum Vitae
3. Make sentences of your own from the words given.

**112– Marathi**

## Syllabus

Subject : Marathi

Class : B.Sc.(II), BCA - II

From    To

| Unit | Particulars | |
|------|-------------|---|
| 1 | निबंध ( २०० शब्दात) | ⑫ |
| | ① विज्ञानावर आधारीत | |
| | ② कल्पकतेवर  –॥– | |
| 2. | गद्य विभाग | |
| | ① सत्य कुठेही शोधू शकते - श्याम मनोहर | ⑮ |
| | ② ज्ञानदेवे रचिला पाया - सदानंद मोरे | |
| | ③ विवेकवादी आणि विज्ञाननिष्ठ : संत तुकाराम - किशोर सानप | |
| | ④ स्त्री-पुरूष स्वातंत्र्याची गोष्ट - अरूणा सबाने | |
| | ⑩ गाव तिथं शाळा - रमेश इंगळे - उत्रादकर | |
| 3. | पद्य विभाग | |
| | ① आणि पृथ्वीला हसू येते - सुधाकर गायधनी | |
| | ② शब्द - शं. गो. चवरे | ⑮ |
| | ③ एकविसाव्या शतकाच्या उंबरठ्यावर | |
| | ④ गाव जुन्या शेणा-मातीचे - जयराम खेडेकर | |
| | ⑩ जन्म-मरणाच्या वेणा - संजीवनी लडेगावकर | |
| 4. | | |
| | ① वाक्प्रचारांचा अर्थ सांगून वाक्यात उपयोग करा. | ③ |
| | ② शुद्धलेखन | ③ |
| | ③ सारांश | ④ |
| | ④ पत्र | ④ |
| | ⑤ माहितीचा अधिकार | ④ |
| | | = ⑱ |

**113– Hindi**

BSC | BCA निर्धारित पाठयपुस्तक : II sem

साहित्य सरीता
सम्पादक –जोगेन्द्रसिंह बिसेन
प्रकाशक–ओरियंट ब्लैकस्वॉन

प्रथम इकाई :(अ) निबंध :–1) विज्ञान                              12
                    2) कल्पानाशील विषय
         (ब) लोकोक्ति                                        03

व्दितीय इकाई : गद्य (1) ढाई आखर प्रेम का                      15
              (2) वापसी
              (3) इमाम साहब
              (4) सलाम
              (5) छप्पन तोले का करधन

तृतीय इकाई : पद्य (1) जागो फिर एक बार                         15
              (2) यह तुम थी
              (3) हो गई है पीर पर्वत सी
              (4) बीस साल बाद
              (5) प्रजापति

चतुर्थ इकाई : 1) पारिभाषिक शब्दावलीका अर्थ                    15
              हिन्दी से अंग्रेजी पारिभाषिक शब्द
              अंग्रेजी से हिन्दी पारिभाषिक शब्द

              2) शब्दों का शुध्दीकरण

## 114- Supplementary English

**Unit I : Text prescribed : Understanding India** Edited by B.Keralavarma (Macmillan)
The following essays from the prescribed Text**:**
5. The Idea of India : India's Mosaic of Multiplicities – Shashi Tharoor

6. Roots – Ismat Chugtai

7. A Gandhian in Garhwal – Ramchandra Guha

8. The End of Living and the Beginning of Survival – Chief Seattle

**Unit II :** *The Mayor of Casterbridge by* **Thomas Hardy** (Macmillan, Stories to Remember)

**Unit III : a)Writing Advertisements (**For sale of vehicle(s)/property, For Rent, Situation Vacant, Situation Wanted)
**b) Newspaper Reports (**about accident, fire, functions/events)
**c) Precis Writing**
**Recommended Books: 1. Write Right** by Sarita Manuja (Macmillan)
**2. Macmillan Foundation English** by R.K.DwivediA.Kumar
(Macmillan)

**Unit IV : a) Essay Writing (**Essays on current topics in about 300 words)
**b) Word-formation Rules**
(Adjective Forms of Some Nouns, Some Words Changed into Verbs)

## 115- PROGRAMMING IN 'C++'

**UNIT - I :**
**Object Oriented Methodology**:
Elements of Object Oriented programming, Objects, Classes, OOPs features.
**Classes & Objects:** Specifying a Class, Creating Objects, Accessing Class members, Defining member function, Outside Member Functions as inline, Accessing Member Functions within the class, Static data member, Access Specifiers: Private, Protected and Public Members.

**UNIT - II :**
**CONSTRUCTORS & DESTRUCTORS:** Introduction, Parameterized Constructors, Constructor Overloading, Constructors with Default Arguments, Copy Constructor, Destructor, Order of Construction and Destruction, Static data members with Constructor and Destructors.
**OPERATOR OVERLOADING:** Definition, Overloadable Operators, Unary Operator Overloading, Unary & Binary overloading, Rules for Operators Overloading.

**UNIT - III :**
**DYNAMIC OBJECTS**: Pointers to Objects, Creating and Deleting Dynamic Objects: New and Delete operators, Array of Objects, Array of Pointers to Objects, Pointers to Object Members, this Pointer**.**
**INHERITANCE:** Defining, Abstract classes, Single, Multilevel, Multiple, Hierarchical, Hybrid Inheritance, Constructor and Destructor in Derived Classes.

**UNIT - IV :**
**VIRTUAL FUNCTIONS:** Need for Virtual Functions, definition, Pure Virtual Functions, Abstract Classes, Rules for Virtual Functions.
**EXCEPTION HANDLING:** Exception Handling Model, List of Exceptions, Handling Uncaught Exceptions, Fault Tolerant Design Techniques, Memory Allocation Failure Exception, Rules for Handling Exception Successfully.

## 116- SYSTEM ANALYSIS AND DESIGN

**UNIT - I :**
**Introduction :** System, Subsystems, Components of Computerized Information System, Systems Analysts, SDLC, Prototyping.
**Feasibility Study and Analysis:** Identifying Problems, Organizing Feasibility Analysis: Economic, Financial, Organizational and Technological. Feasibility Decision, Choice of a solution.
**Data Collection:** Interviews, Brain Storming, Questionnaires, Document Search, Observation.

**UNIT - II :**
**Structured tools and techniques of Data analysis :** Structured English, Process Charts, SOP, Decision Tables and Decision Trees, Data Flow Diagram, Data Dictionary.
(Special emphasis on problem solving )
**System Design** : Input design: Input Validation, Human factor Consideration, Messages, System Tolerance. Output design: Categories of output, Design Principles, Control of Output. Forms:

Principles of Form Design, Ways to ensure Quality Forms.
**Codes:** Types, Physical Representation of Codes, Principle of Code Design.

**UNIT - III :**
**Implementation:** Training, Operational Training and Related Activities, Planning to Implement Change, Change Strategies.
**Testing**: Preparation for Testing, Test Execution: Levels of Testing, Component, Function, Subsystem, System, Test Evaluation, Acceptance.
**Conversion**: Cold Turkey, Parallel, Pilot, Modular and Sequential Methods. Conversion Period Length. **System Evaluation.**

**UNIT - IV :**
Project Planning, Metrics for Project Size Estimation, Project Estimation Techniques, **Scheduling:** Work Breakdown Structure, Activity Networks and CPM, Gantt Charts, PERT Charts, Project Monitoring and Control. Risk Management, Software Configuration Management: Necessity, Configuring Management Activities
**Software Reliability and Quality Management:** Software Reliability, Software Quality, ISO 9000. Software Maintenance: Characteristics of Software Maintenance, Maintenance Process Models, Estimation of Maintenance Cost.
**Software Reuse:** What can be reused, Why no reuse so far, Basic Issues.

## 117- NUMERICAL METHODS

**UNIT - I :**
Roots of Non-Linear Equations : Algebraic equation, Polynomial equation, Transcendental equation, Iterative method, Starting & Stopping Iterative method, Bisection Method, False Position

method, Newton Raphson Method: Secant Method, Determining all possible roots, Multiple roots of polynomial, Complex Roots using Muller's Method.

**UNIT - II :**
Solution to Linear Equations Existence of solution, Gauss Elimination Method, Gauss elimination with pivoting, Gauss Jordan Method, Round off errors and refinement, m Conditioned system, Matrix inversion method.

**UNIT - III :**
Linear interpolation, Lagrange Interpolation, Spline Interpolation, Interpolation with equidistant points, Least Square regression Fitting, Transcendental equations, Multiple linear regression, m conditioning in Least square

**UNIT - IV :**
Integration & Differentiation : Trapezoidal Rule, Simpson 1/3 Rule, Simpson 3/8 rule, Gaussian Integration, Solution to differential equation (using Runge-Kutta second and fourth order methods, Multistep method for differential equations (Milne-Simpson method, Adams-bashforth-

## 118- DISCRETE MATHEMATICS – 2

**UNIT - I :**
Set Theory:
Set, Subsets operations on set, Venn diagram, algebra on sets, Cartesian product of sets, Binary relations, Properties of binary relation, Relation matrix and the graph of relation, Partial order relations, Equivalence relations, Equivalence Classes, Composition of relations.

**UNIT - II :**
Functions - definition, types of function, Invertible functions composition of functions.
Counting - Permutation, Combinations, The pigeonhole principle, recurrence relation, Mathematical Induction.

**UNIT - III :**
Algebraic Structures Semi groups & groups: Binary operations, Semi groups, isomorphism and Homomorphism, Product and Quotient of semi groups, Groups, subgroups, products and Quotient of groups.
Lattices: - Lattice concepts, isomorphic Lattices, Properties of lattices, Finite Boolean algebras.

**UNIT - IV :**
Graph Theory: Basic concepts, types of graphs, Representation of graph in memory, Euler path and circuits, Hamiltonian Path and circuits.
Trees:- Basic concepts, Libeled trees, Undirected trees.

## 119- LINUX OPERATING SYSTEM

**UNIT - I :**
Logging In and Logging Out, Anatomy of Linux OS, Directory Structure, /usr Directory, File Types: User datafiles, System data files, Executable files. Naming files and directories, Spawning Processes. **Shell:** Creating User Account, Shell Program, bash shell, Changing shell prompt.

**Commands:** Basic Syntax for a command, Exploring the Home Directory, ls, mkdir, rmdir, stat, cat, rm, mv, cp

**UNIT - II :**
**Editor:** Vi editor. **Hooking up Hardware Devices:** Formatting a Floppy Disk**,** Gathering important system information. Backing Up and restoring the File **System:** Simple Backup, gzip, gunzip, tar. **Printing files:** Print Spool directory, Sending files to Printer.

**UNIT - III :**
**Sharing Files with other Users:** Maintaining User Accounts, Changing Password, Creating Group Accounts, Granting Access to files, Changing File Ownership, Protecting Files, Making a File Read-Only. Working with Processes**:** Types of processes, ps Command, Creating process, killing process, free command and top utility.

**UNIT - IV :**
**Managing Disk Space:** df, du commands, Creating Additional Free Disk Space, Locating Unused Files, Setting System Clock. Communication Utilities: who, who am i, finger, mesg, write, wall, talk, Creating a message of the day. X Window System, Graphical User Interfaces: KDE and GNOME Desktop Environment.

## 120- E COMMERCE

**UNIT - I :**
Introduction to e-Commerce, Scope of electronic commerce, definition, e-Commerce and Trade Cycle, e- Markets, Internet e-Commerce in perspective. Value chain, Supply chain, Porters value chain model, Inter organizational value chains.

**UNIT - II :**
Business strategy in electronic age: Competitive advantages, Strategy, Porters model, First Movers advantages, Advantages using e-Commerce. Introduction to business strategy, Strategic implications of IT, Technology, Business environment, Business capability, Existing business strategy, Strategy formulation and implementation planning, e-Commerce implementation, e-Commerce evaluation.

**UNIT - III :**
Business to Business e-Commerce: Inter organizational transactions, The credit transaction trade cycle, A variety of transaction, Pens and things, Electronics Market, Usage of e-Market, Advantages and disadvantages of e-Market, Future of e-Market, EDI, introduction, EDI and Business.

**UNIT - IV :**
Business to Consumer Electronic Commerce: Consumer trade transaction, Internet e-Commerce, e-Shop, Other e-Commerce technologies, Advantages and disadvantages of comsumer e-Commerce. Elements of e-Commerce: elements, e-Visibility, e-Shop, Online payments, Internet e-Commerce security.

**121- Practical-I Practical-I Based on Paper I &II**

**122- Practical-II Practical-II Based on Paper III &IV**

**123 - Practical-III Practical-III Based on Paper V &VI**

# Bachelor of Computer Application (BCA) SEMESTER-III

## 124-VISUAL BASIC PROGRAMMING

**UNIT-I :**
**Working with Visual Basic Window Components:** Menu Bar, Tool Bar, Project Explorer Window, Form Layout Window, properties Window, Toolbox, Code Editor Window Working with Forms: Properties, Events, Methods Working with Basic Controls: Label, Command Button, Text Box, Option Button, Frame, Check Box, List Box, Combo Box, Image, Scroll, Picture, Timer, Drive List Box, Dir List Box, File List Box and Shape Controls. Basic Programming Fundamentals: Variables, Data types, Constant, Conversion Function. Scope of Variable: Public, Private Static. Operators: Logical, Arithmetic, Concatenation, Comparison. Decision Structure: If.. Then, If Then Else, Select Case.. End Case. Loop Structure: Do..While, While.. Wend, For.. Next, With End With. Do Events()

**UNIT-II :**
**Arrays:** Dynamic Array, Preserve and Control arrays. Procedure: General procedure, General Methods for Passing Arguments to a Procedure, Functions: User-Interaction, String, Math, Date, Conversion Functions. Modules: Form, Standard.

**UNIT-III : Menus**: Creating, Adding Menu Items, Creating Shortcut, Adding Separators Bars, Submenus, Code for Menus. Creating Popup Menu: System, Custom. Database Handling: Database Concepts, Creating and Accessing Database, Using Data Control. Using DAO: Creating Search Programs, Numeric Search and Complex Search Programs.

**UNIT-IV** : Using ADO Data Control, Data Link, ODBC Data Source name, Using Connection String, Creating Navigating buttons. Working with Advanced Data Controls : DataList Control, DataCombo Control, Data Grid Control and Msflexgrid Control. Handling Errors : Run Time, Trapping and Handling Error, ERR Object. Data Environment and Data Reports.

## 125- DATA BASE MANAGEMENT SYSTEM

**UNIT- I : DBMS :** Definition: Databases, DBMS, Problems with traditional file processing system, Objectives of the database systems, Three level architectures of DBMS, Component of DBMS, Database Administrator, Database Users, Data model, Different types of data models, Concepts of Hierarchical, Network Models.

**UNIT-II : E-R Models** : Basic Concepts, Entity, Attributes, Relation Ship, Mapping, Keys, Weak and Strong Entity Set, Problems on E-R Diagrams, Extended E-R Features: Specialization, Generalization, Aggregation, Problems on Reduction of an E-R Schema to Tables, Tabular representation of Strong, Weak entity Sets and Relationship Sets.

**UNIT-III :** Relational Model: Structure, Relational Algebra, Fundamental Operations, Set – Intersection, Natural Join, Division and Assignment Operation. Extended Relational Algebra Operations, Aggregate Functions.

**UNIT–IV : Functional Dependency:** Functional Dependency, Fully Functional Dependency, Partial Dependency, Transitive Dependency, Multi Valued Dependency. Normalization, Normal Forms ( 1NF, 2NF, 3NF, BCNF, 4NF, 5NF). Problems on Normal

# 126-DATA STRUCTURES

**UNIT - I: LINKED LIST :** Linked List, Representation of Single, Double, Header, Circular Single and Double Linked list, All possible operations on Single and Double linked List using Dynamic representation, Polynomial Representation and its Manipulation.

**UNIT - II : STACKS** : Stacks terminology, Representation of Stacks in Memory, Operation on Stacks, Polish Notations, Translation of infix to postfix & prefix expression, Infix to Postfix Conversion, Evaluation of Postfix Expression, Recursion, Problems on Recursion, Quick Sort and Tower of Hanoi Problem.

**UNIT - III: QUEUE**: Representation of Queues in Memory, Circular Queue. Dequeue and Priority Queue. Operations of above Structure using Array and Linked Representation. SORTING AND SEARCHING: Selection Sort, Insertion Sort, Merge Sort, Efficiency of Sorting Methods, Big-O Notations. Hash Tables, Hashing Technique, Collision Resolution Technique.

**UNIT - IV: TREES** : Basic Terminologies, Representation of Binary Trees in Memory, Traversing of Binary tree, Binary Search Tree, Operation on Binary Search Tree, Heap Tree, Operation on Heap Tree, Heap Sort Method GRAPHS : Basic Terminologies, Definition and Representation of Graphs in Memory: Linked List and Matrix Representation. Traversing graphs: BSF, DFS Method

# 127- OPERATIONS RESEARCH – I
**UNIT - I : Introduction to Operation Research** (OR) Origin and development of OR, Nature of OR, Characteristics of OR, Classification of Problems in OR, Models in OR, Phases of OR, Uses and Limitations of OR, Methodologies of OR, Applications in OR. Linear Programming – Concepts of Linear Programming Model, Mathematical Formulation of the Problem, Graphical solution methods.

**UNIT - II : Linear Programming Methods** – Simplex Methods, Big M methods, Dual Simplex Method, Two Phase methods. Duality in Linear Programming – Formulation of Dual Problem, Application of Duality.

**UNIT - III : Transportation Problem** Mathematical model for Transportation Problem, Types of Transportation Problem

**UNIT - IV: Assignment Problem** – Zero-One Programming Model for Assignment Problem, Types of Assignment Problem, Hungarian Method, Branch and Bound Technique for Assignment Problem.

# 128- WEB TECHNOLOGY – I

**UNIT - I :** Introduction to Internet, History of Internet, Internet users, Internet working, Information on Internet, Requirements for connecting to Internet, Basic Internet Terms, Introduction to world wide web, Evaluation of world wide web, basic features, web browsers, popular web browsers, web servers, HTTP, URL, Search Engines, Search Engines categories, how to use Search Engines, Searching criterion.

**UNIT - II : HTML**: Introduction, Objective, HTML Browsers, Windows Switching, HTML Command Tags, URLs, links, new web page creation, main body of the text, putting headers, adding paragraph , formatting text in HTML and font mechanism, Color settings, superscripts and subscripts and other manipulations on text and paragraphs, using directory and menu lists, creation of links, inserting graphics, using images, all manipulations on tables and its display, Detailed working with forms, allowing visitors to upload files, active images ,working with frames & framesets, Frames handling, scroll bars, alternatives to frames,

**UNIT - III : Introduction to browsers,** Working with e-mail, Parts of e-mail text, working with messages. DHTML: using DHTML in internet explorer, heading and horizontal line, hidden message, the message at the center of the page, moving boxes ,changeable box.

**UNIT - IV : Cascading style sheets** Introduction to css, creating style sheets, common tasks with CSS, Colors, the font - family, font metrics ,length units ,absolute units ,relative units ,the pixel unit ,percentages as values ,keywords as values, various properties such as the font -size property, font - size property etc, Assigning classes ,tags and attributes for applying classes, applying classes to an HTML tag, applying classes to other document parts ,the layer tag, CSS Tags.

## 129- DIGITAL ELECTRONICS – I

**UNIT - I : Number System and Data Representation Number System** : Binary, Octal, Decimal and Hexadecimal number system and their interconvertion. Binary Codes : BCD, Excess3 , Parity, Gray, ASCII, EBCDIC codes and their advantages and disadvantages.

**UNIT - II: Binary Arithmetic Data Representation:** Positive, negative, maximum and minimum number representation (related to 8 bit number), real number representation, underflow, overflow, range and accuracy. Binary Arithmetic: Binary addition, binary subtraction using 1's and 2's compliment.

**UNIT - III: Logic gates:** Truth table, properties and symbolic representation of NOT, AND, OR, NOR, NAND, EXOR, EXNOR gates. NOR and NAND gates as a universal gates.

**UNIT - IV: Boolean Algebra**. Laws and Identities of Boolean algebra, DeMorgan's Theorem , use of Boolean Algebra for simplification of logic expression, K-Map for 2,3,4 variables, simplification of SOP and POS logic expression using K-Map.

**130 Practical-I Based on Paper I &II**
**131 Practical-II Based on Paper III &IV**
**132 Practical-III Based on Paper V &VI**

# Bachelor of Computer Application (BCA) SEMESTER-IV

## 133-SOFTWARE ENGINEERING – I

**UNIT - I : Introduction to Software Engineering** : The evolving role of software, Changing Nature of Software, Software myths. A Generic view of process : Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

**UNIT - II : Process models** : The waterfall model, Incremental process models, Evolutionary process models, The Unified process. Software Requirements : Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

**UNIT - III : Requirements engineering process :** Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management. System models : Context Models, Behavioral models, Data models, Object models, structured methods.

**UNIT - IV : Design Engineering :** Design process and Design quality, Design concepts, the design model

## 134- SQL AND PL/SQL

**UNIT - I :**
CODD'S Rules, Oracle Database Objects, Sub Languages of SQL, Data types, Operators. DDL Statement: Creating Tables, Deriving Table from existing table, Altering, Dropping Tables.Integrity Constraints, Specifying Names for the Constraints, Viewing Integrity Constraints, Adding and Dropping Constraints. DML Statements: SELECT statement, Insert, Update, Delete, Working with Sequences and Synonyms. Built-in functions: Arithmetic, Date,Character, Conversion, Single row, Aggregate, Decode.Joins, Set Operators and Sub queries. DCL and TCL Statements: Grant, Revoke, Commit, Rollback and Savepoints.

**UNIT - II :**
VIEWS: Creating Views, Dropping Views, Inserting, Updating and Deleting Data using Views, Types of Views. PL/SQL Programming: PL/SQL Data Types, Identifiers, Operators and Expressions, Iterative Statements, Conditional Statements, emphasis on Problems

**UNIT - III :**
Exception Handling : Predefined Exceptions, User defined Exceptions. Cursors: Declaring Cursors, Opening and Retrieving Records, Closing cursors. Attributes of Explicit and  Implicit Cursors, Parameter Passing in Cursors. Procedures : Create and Drop Procedure, Creating Procedures with Parameters, Calling Procedures, Granting the EXECUTE Permission Problems on Exception Handling, Cursors and Procedures.

**UNIT - IV :**
Function: Creating and Dropping Function, Purity Levels in Functions, Executing Functions. Triggers: Create Triggers, Type of Triggers, Creating BEFORE and AFTER Triggers, INSTEAD-OF Triggers, Trigger Predicates, Inserting, Updating and Deleting Triggers, Enabling , Disabling and Dropping Triggers. Problems on Functions and Triggers.

## 135-THEORY OF COMPUTATION

**UNIT - I : Finite Automation and Regular Expression** : Finite State systems, Basic Definitions, Non -deterministic finite Automata, Finite Automata with moves, Regular Expressions, Two way finite automata, Finite automata with output, Application on Finite Automata.

**UNIT - II : Properties of Regular Sets** : The pumping lemma for Regular Sets, Close properties of Regular sets, Decision Algorithms for Regular Sets. Context Free Grammars, Context Free Grammar, Derivation Tree

**UNIT - III : Simplification of context Free Grammars,** Chomsky Normal form, Greibach normal form, The existence of inherently ambiguous context free languages. Properties of Context free languages : The pumping lemma for CFL's , Closure properties of CFL's,

**UNIT - IV: Push Down Automata** : Informal description, Definitions, Push – Down Automata & Context free languages.

## 136-OPERATIONS RESEARCH – II

**UNIT - I : Game Theory** – Terminologies of Game Theory, Two Person Zero-Sum Games, The Maximin-Minimax Principle, Games without Saddle points-Mixed Strategies, Graphical Solution of 2x n and m x 2 games, Dominance Property. Introduction, Decision under Certainty, Decision under Risk, Decision under Uncertainty, Decision Tree.

**UNIT - II : Network Scheduling by CPM/PERT –** Introduction, Basic Concept, Constraints in Network, Critical Path Method (CPM), PERT Network, PERT calculations, Time-Cost trade-off aspects in Network Technique, Advantage of Network (PERT/CPM).

**UNIT – III : Inventory** Control Introduction, Inventory Control, Selective Control Techniques, Types of Inventory, Economic Lot Size Problem, Problem of EOQ with shortage, Inventory Control Techniques – Uncertainty Demand, Stochastic Problem, Inventory Control with Price Breaks.

**UNIT – IV : Queuing Theory Introduction**, Terminologies in Queuing System, Characteristics of Queuing System, Poisson Process and Exponential Distribution, Classification of Queues, Definition of Transient and Steady states, Poisson Queues, Non-Poisson Queuing Systems, Cost-Profit Models in Queuing, Queuing Control.

## 137-WEB TECHNOLOGY – II

**UNIT - I :**
Introduction, JSP lifecycles, Elements in JSP Pages , values and variables, operators, loops and various statements in java script, Date object, Math object, string object, window events, working with forms, document object, screen object, navigator object, images and animation.

**UNIT - II :**
Java script objects, Implicit JSP Objects, JSP Object scopes, JSP Tags, Declarations, Directives, JSP Tags, JSP Exceptions, Expressions, Scriptlet, Actions, Expression Language, JSP Standard Tag library, JSP Custom Tag library, Java Script security.

**UNIT - III :**
VB Script:Adding VB Script code to HTML, Adding script to your document, Data types, Arrays in script, Messages, Subroutines, functions, if..then..else, for..next loop, do while or do until, Select case construct, Manage your web site with Task and Reports : Keep track of workeith tasks, Check your site with your web site report, Publishing web site to a WPP host server.

**UNIT - IV :**
Web Services :Ev0lution of the concept, Purpose, standards, Use cases, programming models, SOAP Based web services, WSDL,, SOAP, Structure of SOAP messages, REST based Web Services, REST principles, Resource Orientation, SOAP vs. REST.

## 138- DIGITAL ELECTRONICS – II

**UNIT - I** :
Combinational / Sequential CircuitsCombinational circuits:Half adder, Full Adder, Parallel adder, Half subtractor, Full Subtractor, 4-bit binary adder subtractor, Multiplexer, Demultiplexer, Decoder, Encoder, Parity detector.

**UNIT - II :**
Sequential Circuits: Flip-Flops : Construction and working of RSFF, CkRSFF, DFF, TFF, JKFF, and JKMSFF . Counters: Construction and working of asynchronous, synchronous, up-down counter, shift registers and their types.

**UNIT - III** : Architecture of 8086 and Assembly Language Programming Block diagram of 8086, Pin diagram of 8086, Addressing modes,

**UNIT - IV :** Instruction set: Data transfer, Arithmetic, Logical, String manipulations, Control Transfer, Unconditional branch, Conditional branch, Flag, Processor control. Assembler directives and operators, simple assembly programs.

**139-Practical-I Based on Paper I &II**
**140-Practical-II Based on Paper III &IV**
**141-Practical-III Based on Paper V &VI**

# Bachelor of Science (B.Sc. (IT)) Semester-I

**142- English**

### Unit I - Prose Lessons

1. The House
2. The Boy Who Broke The Bank
3. Parveen
4. The Selfish Giant

### Unit II - Poems

1. Eyes Immortal
2. Elegy Written in a Country Churchyard
3. Ulysses
4. Ecology

### Unit III - Grammar

1. Tenses
2. Voice
3. Prepositions

### Unit IV – Composition, Comprehension & Vocabulary

1. Letter Writing
2. Comprehension
3. Synonyms and Antonyms

**143- Marathi**

## Syllabus

ss : B.SC (IT), B.C.A. I<sup>ST</sup> SEM.   Subject : MARATHI

'शब्दगंध'

| Unit | Particulars | From | To |
|------|-------------|------|-----|
| 1 | वर्तमानकालीन सामाजिक, पर्यावरण विषयावर आधारित निबंध (दोन पैकी एक) | ⑫ गुण | |
| 2. | गद्य विभाग <br> 1) शेतकऱ्यांविषयी - म. जोतीबा फुले <br> 2) स्टीमरमध्ये - म. गांधी <br> 3) विज्ञान शाप की वरदान - द.के. केळकर <br> 4) ज्ञान - साने गुरुजी <br> 5) स्वदेशवचं संशोधन - भालचंद्र नेमाडे | ⑮ गुण | |
| 3. | पद्य विभाग <br> 1) दुरितांचे तिमिर जावो - संत ज्ञानेश्वर <br> 2) वृक्षवल्ली आम्हां सोयरे - संत तुकाराम <br> 3) आम्ही कोण? - केशवसुत <br> 4) कशाला पंढरी जातो? - राष्ट्रसंत तुकडोजी महाराज <br> 5) आहे बुद्धीसी स्मान - बा.सी. मर्ढेकर | ⑮ गुण | |
| 4. | 1) म्हणींचा अर्थ सांगून वाक्यात उपयोग करा | ⓞ३ गुण | |
| | 2) सारांश | ⓞ४ गुण | |
| | 3) कार्यालयीन पत्र | ⓞ४ गुण | |
| | 4) इंग्रजीच्या उताऱ्याचे मराठीत भाषांतर करा. | ⓞ४ गुण | |
| | 5) शुद्धलेखन | ⓞ४ गुण | |

**144- Hindi**

बी.एस.सी.प्रथम वर्ष
पाठ्यक्रम हिन्दी (प्रथम सेमिस्टर)
(बी.सी.ए / बी.एस.सी.आईटी)

समय. 03घण्टे                                   पूर्णांक : 60

निर्धारित पाठ्यपुस्तक                        साहित्य सरीता
                                            सम्पादक –जोगेन्द्रसिंह बिसेन
                                            प्रकाशक–ओरियंट ब्लैकस्वॉन

प्रथम इकाई :(अ) निबंध :– समसामायिक विषय                      15
          (ब) मुहावरे

व्दितीय इकाई : गद्य (1) ईदगाह                               15
              (2) गुण्डा
              (3) परदा
              (4) जिंदगी और जोंक
              (5) मै हार गई

तृतीय इकाई :  पद्य (1) तोडती पत्थर                           15
              (2) कालीदास से
              (3) कहों तो तय था चिरागों
              (4) रोटी और संसद
              (5) मारे जायेंगे

चतुर्थ इकाई :  पत्राचार (पत्रों के प्रकार)                    15
              (अ) (1) कार्यालयीन पत्र
                  (2) व्यावसायिक पत्र
                  (3) व्यावहारिक पत्र
                  (4) आवेदन पत्र
              (ब) नौकरी हेतु आवेदन पत्र

## 145- Supplementary English

**Unit I : Prescribed Text**: **Understanding India** Edited by B. Keralavarma (Macmillan)
The following essays from the prescribed Text:
5. Brother Abdul Rahman – Amarlal Hingorani
6. Gandhi and the Western World - Louis Fischer
7. The Cow of the Barricades – Raja Rao
8. The Smaller Gandhis – Mohinder Singh Sarna

**Unit II : The Old Man and the Sea** by **Ernest Hemingway (Duttsons)**

**Unit III: Vocabulary Expansion**
(Some Common Foreign Words Used in English, One Word for a Group of Words, Idioms and Phrases)

**Unit IV: a) Expansion of an Idea**
**b) Word-formation Rules**
(Noun Forms of Some Adjectives, Noun Forms of Some Verbs)
**c) Precis Writing**

## 146- Fundamentals of Information Technology

UNIT - I : Basic Components of Digital Computers: Block Diagram. CPU: Functions of Each Unit: Primary Memory, ALU and CU, Instruction format. Bus: Data, Control and Address Bus Number Systems: Binary, Octal, Decimal, HexaDecimal, Their Conversions, Binary Arithmetic. ASCII, BCD, EBCDIC. Language Evolution : Generation of Languages : Machine, Assembly, High Level Languages. Characteristics of Good Language Translators : Compiler, Interpreter and Assembler. Source and Object Program.

UNIT - II : Memory: Static & dynamic, RAM, ROM, PROM, EPROM, EEPROM, flash and Cache. Storage Devices: Hard Disk, Zip Disk and Optical Disk. Pen Drive, Blue Ray

UNIT - III : Input Devices: Keyboard, Mouse, Light Pen, Touch Screen, Voice Input , MICR, OCR, OMR, Barcode Reader and Flatbed Scanner. Output Devices: VDU, Printers: Dot Matrix, Laser and Inkjet. Plotters: Drum, Flat-Bed and Inkjet.

UNIT - IV : Network: Network terminology, Topologies : Linear, Circular, Tree and Mesh. Types of Networks: LAN, WAN, MAN. Repeaters, Bridge, Routers, Brouters and Gateway. Modem for Communication between pc's, wi-fi network, Introduction of Bluetooth and Infrared devices. Network protocols. Architecture : Peer-to-Peer, Client/Server.

## 147- Programming Methodology in C

UNIT- I : Programming Structure : Sequence, Selection, Iteration and Modular. Problem Solving techniques: Development Tools: Algorithm, Flowcharts and Pseudo code (Definition and its characteristics) Developing Algorithm and Drawing flowcharts

UNIT- II : C Character set, Tokens, Identifier, Keywords, Variables, Data types, Qualifiers. Operators and Expressions: Arithmetic, Relational, Logical, Bit-Wise, Increment, Decrement,

Conditional and Special operators. typedef, Type Conversion, Constants, Declaring Symbolic Constants, Character Strings, Enumerated Data Types, Operator Precedence and Associativity. Library functions. : Maths, string handling Functions. Control Structure: Compound Statement, Selection Statement: if, if-else, Nested if, switch. Iteration statement: for, while, do..while, Nested loops, Jump statement: break, continue, goto. (Special emphasis on problem solving)

UNIT- III : Arrays: Need, Types: Single and Two Dimensional Array. Strings: Strings Manipulation, Arrays of Strings, Evaluation order Function: Function Components, Return Data type, Parameter Passing, Return by Reference, Default Arguments, Recursive Functions, Arrays with Functions, Storage Classes. (Special emphasis on problem Solving )

UNIT- IV: Structure: Declaration, Definition, Accessing structure members, Initialization, Nesting of Structures. Union: Unions, Differences between Structure and Union Pointer: Introduction, Address Operator (&), Pointer variables, Void pointers, Pointer Arithmetic, Pointers to Pointers. File handling: Hierarchy of File Stream Classes, Opening & closing a file, Testing for errors, File Modes, File pointers and their manipulations, Sequential Access, Random Access, Command Line arguments.

## 148- System Analysis and Design

UNIT - I : Introduction : System, Subsystems, Components of Computerized Information System, Systems Analysts, SDLC, Prototyping. Feasibility Study and Analysis: Identifying Problems, Organizing Feasibility Analysis: Economic, Financial, Organizational and Technological. Feasibility Decision, Choice of a solution. Data Collection: Interviews, Brain Storming, Questionnaires, Document Search, Observation.

UNIT - II : Structured tools and techniques of Data analysis : Structured English, Process Charts, SOP, Decision Tables and Decision Trees, Data Flow Diagram, Data Dictionary. (Special emphasis on problem solving ) System Design : Input design: Input Validation, Human factor Consideration, Messages, System Tolerance. Output design: Categories of output, Design Principles, Control of Output. Forms: Principles of Form Design, Ways to ensure Quality Forms. Codes: Types, Physical Representation of Codes, Principle of Code Design.

UNIT - III : Implementation: Training, Operational Training and Related Activities, Planning to Implement Change, Change Strategies. Testing: Preparation for Testing, Test Execution: Levels of Testing, Component, Function, Subsystem, System, Test Evaluation, Acceptance. Conversion: Cold Turkey, Parallel, Pilot, Modular and Sequential Methods. Conversion Period Length. System Evaluation.

UNIT - IV : Project Planning, Metrics for Project Size Estimation, Project Estimation Techniques, Scheduling: Work Breakdown Structure, Activity Networks and CPM, Gantt Charts, PERT Charts, Project Monitoring and Control. Risk Management, Software Configuration Management: Necessity, Configuring Management Activities Software Reliability and Quality Management: Software Reliability, Software Quality, ISO 9000. Software Maintenance: Characteristics of Software Maintenance, Maintenance Process Models, Estimation of Maintenance Cost. Software Reuse: What can be reused, Why no reuse so far, Basic Issues.

## 149- Web Technologies

UNIT I Introduction to Internet, Requirement for connecting to internet, Basic internet term, Introduction to World Wide Web (WWW), Evaluation of world wide web, basic features of www, web browsers, web server. Internet Security: Secure Transaction, Privacy issues, computer crimes and its type. Security Issues: Security threats like damage to data, loss of data and unauthorized use of data. Security Procedure: Firewall, Encryption, Password, Access Control List, Digital Certificate.

UNIT – II

Introduction to HTML, Features of HTML , Advantage and Disadvantage of HTML, Basic structureof HTML documents. Creating web pages with HTML Tags : <HTML>, <HEAD>, <TITLE>,<BODY>,Heading tags, Paragraph tags, Alignment, Font tag and its attributes, line break, Preformatted text tag, list element (Unordered lists, ordered list, Definition list, Marquee tags and itsattribute. Character formatting tags: Logical verses physical style, logical and physical tags.Changing the colors of the fonts. Linking :Relative pathnames verses absolute pathnames, URLs,Linking within a web page, linking to a different web page, linking to external web page, linking toan image by image, linking to document located in different directory, types of URLs .

UNIT – III

Images: IMG element and its attributes, Images as a Hyperlink, Image map, Image Formats, Frames. Tables: TABLE element and its attributes, Creating simple tables, Row element, Data element, Spanning rows and columns. Form designs: Form Controls, Text controls, password fields, radio buttons, checkboxes, reset and submit buttons, select element, option , Image and textarea. Embedding Multimedia: Introduction, Embedding Multimedia, Inserting sound/audio formats, video file formats. DHTML: using DHTML in internet explorer, heading and horizontal line, hidden message, the message at the center of the page, moving boxes , changeable box.

UNIT – IV

Cascading Style Sheets (CSS): advantage of CSS, Disadvantage of CSS, Defining a Style, Inline style sheet, Embedded Style sheet, External style sheets. Style sheet Properties: Font, color, background, creating group, text, Box properties, span tag. Scripting Language: JAVA SCRIPT – Introduction, Advantages, Disadvantages, Working of JavaScript, Structure of JavaScript program, Variable, Data types, Operators & Expression, Decision Making- if—else, switch, loops(for, for…in, while, do…while), break & continue, , Arrays

## 150- Multimedia Application Development

Unit I Fundamental concepts in Text and Image: Multimedia and hypermedia, world wide web, overview of multimedia software tools. Graphics and image data representation graphics/image data types, file formats, Color in image and video: color science, color models in images, color models in video.

Unit II Fundamental concepts in video and digital audio: Types of video signals, analog video, digital video, digitization of sound, MIDI, quantization and transmission of audio.

Unit III Action Script I: ActionScript Features, Object-Oriented ActionScript, Datatypes and Type Checking, Classes, Authoring an ActionScript Class. Action Script II: Inheritance, Authoring an ActionScript 2.0 Subclass, Interfaces, Packages, Exceptions.

Unit IV Application Development: Application Frame work, Using Components with ActionScript MovieClip Subclasses. Multimedia data compression: Lossless compression algorithm: Run-Length Coding, Variable Length Coding, Dictionary Based Coding, Arithmetic Coding, Lossless Image Compression, Lossy compression algorithm: Quantization, Transform Coding, WaveletBased Coding, Embedded Zerotree of Wavelet Coefficients Set Partitioning in Hierarchical Trees (SPIHT).

## 151- Applied Mathematics-I

UNIT- I: Propositional Calculus: Connectives, Negation, conjunction, Disjunction, statement formulas and truth tables, conditional and Bi-conditional, well formed formulas, Tautologies, Equivalence of formulas, duality law, Tautologies implications, Functionally complete set of, other connectives,

UNIT- II: Disjunctive normal forms, connective normal forms, Principal disjunctive normal form, Principal conjunctive normal form.

UNIT- III: Predicate Calculus: The theory of Inference for statement Calculus, validity using truth tables, Rules of inference, consistency of premises and indirect method of Proof

UNIT- IV: The statement function, variables and quantifier, Predicate formulas, Free and Bound variables, The universe of Discourse, Theory of inference for predicate calculus.


## 152- Practical-I Practical-I Based on Paper I &II

## 153- Practical-II Practical-II Based on Paper III &IV

## 154 - Practical-III Practical-III Based on Paper V &VI

# Bachelor of Science (B.Sc. (IT)) Semester-II

**155- English**

### Unit I - Prose Lessons

1. Maintaining Democracy
2. The Verger
3. Two Gentlemen of Verona
4. Freedom at Midnight

### Unit II - Poems

1. Where the Mind is without Fear
2. My Last Duchess
3. Up Hill
4. The Village Schoolmaster

### Unit III - Grammar

1. Subject-Verb Agreement
2. Transformation of Sentences
(Interchange of Degrees of Comparison, Affirmative and Negative Sentences, Interrogative and Assertive Sentences, Exclamatory and Assertive Sentences)
3. Exercises on Common Errors

### Unit IV – Comprehension & Composition

1. Comprehension
2. Curriculum Vitae
3. Make sentences of your own from the words given.

**156- Marathi**

II<sup>ND</sup> IV<sup>TH</sup> Sem

## Syllabus

Subject : Marathi

Class : B. Sc (II), BCA - II

| Unit | Particulars | From | To |
|------|-------------|------|-----|
| 1 | निबंध ( २०० शब्दांत) <br> ① विज्ञानावर आधारित <br> ② कल्पकतेवर -''- | ⑫ | |
| 2. | गद्य विभाग <br> ① सत्य कुठेही शोधू शकले - श्याम मनोहर <br> ② ज्ञानदेवे रचिला पाया - सदानंद मोरे <br> ③ विवेकवादी आणि विज्ञाननिष्ठ : संत <br> तुकाराम - किशोर सानप <br> ④ स्त्री-पुरुष स्वातंत्र्याची गोष्ट - अरुणा सबाने <br> ⑤ गाव तिथं शाळा - रमेश इंगळे - उत्रादकर | ⑮ | |
| 3. | पद्य विभाग <br> ① आणि पृथ्वीला हसू येते - सुधाकर गायधनी <br> ② शब्द - शं. गो. चवरे <br> ③ एकविसाव्या शतकाच्या उंबरठ्यावर <br> ④ गाव जुन्या शेणा-मातीचे - जयराम खेडेकर <br> ⑤ जन्म-मरणाच्या वेणा - संजीवनी लढेगावकर | ⑮ | |
| 4. | ① वाक्प्रचारांचा अर्थ सांगून वाक्यात उपयोग करा. ④ <br> ② शुद्धलेखन ③ <br> ③ सारांश ④ <br> ④ पत्र ④ <br> ⑤ माहितीचा अधिकार ④ <br> = ⑱ | | |

**157- Hindi**

BSc|BCA निर्धारित पाठ्यपुस्तक :- II Sem

साहित्य सरीता
सम्पादक –जोगेन्द्रसिंह बिसेन
प्रकाशक–ओरियंट ब्लैकस्वॉन

प्रथम इकाई :(अ) निबंध :–1) विज्ञान               12
           2) कल्पानाशील विषय

(ब) लोकोक्ति             03

द्वितीय इकाई : गद्य (1) ढाई आखर प्रेम का      15
       (2) वापसी
       (3) इमाम साहब
       (4) सलाम
       (5) छप्पन तोले का करधन

तृतीय इकाई : पद्य (1) जागो फिर एक बार     15
       (2) यह तुम थी
       (3) हो गई है पीर पर्वत सी
       (4) बीस साल बाद
       (5) प्रजापति

चतुर्थ इकाई : 1) पारिभाषिक शब्दावलीका अर्थ   15
       हिन्दी से अंग्रेजी पारिभाषिक शब्द
       अंग्रेजी से हिन्दी पारिभाषिक शब्द

       2) शब्दों का शुध्दीकरण

## 158- Supplementary English

**Unit I : Text prescribed : Understanding India** Edited by B.Keralavarma (Macmillan)
The following essays from the prescribed Text**:**
5. The Idea of India : India's Mosaic of Multiplicities – Shashi Tharoor

6. Roots – Ismat Chugtai

7. A Gandhian in Garhwal – Ramchandra Guha

8. The End of Living and the Beginning of Survival – Chief Seattle

**Unit II :** *The Mayor of Casterbridge by* **Thomas Hardy** (Macmillan, Stories to Remember)

**Unit III : a)Writing Advertisements (**For sale of vehicle(s)/property, For Rent, Situation Vacant, Situation Wanted)
**b) Newspaper Reports (**about accident, fire, functions/events)
**c) Precis Writing**
**Recommended Books: 1. Write Right** by Sarita Manuja (Macmillan)
**2. Macmillan Foundation English** by R.K.DwivediA.Kumar
(Macmillan)

**Unit IV : a) Essay Writing (**Essays on current topics in about 300 words)
**b) Word-formation Rules**
(Adjective Forms of Some Nouns, Some Words Changed into Verbs)


## 159- Fundamentals of Digital Electronics

Unit – I Data and Information: Features of Digital Systems, Number Systems: Decimal, Binary, Octal, Hexadecimal & their inter conversions, Representation of Data: Signed Magnitude, one's complement & two's complement, Binary Arithmetic, Fixed point representation and Floating point representation of numbers. Codes: BCD, XS-3, Gray code, hamming code, alphanumeric codes (ASCII, EBCDIC, UNICODE), Error detecting and error correcting codes.

Unit- II Boolean Algebra: Basic gates (AND, OR, NOT gates), Universal gates (NAND and NOR gates), other gates (XOR, XNOR gates). Boolean identities, De Morgan Laws. Karnaugh maps: SOP and POS forms, Quine McClusky method.

Unit –III Combinational Circuits: Half adder, full adder, code converters, combinational circuit design, Multiplexers and demultiplexers, encoders, decoders, Combinational design using mux and demux. Sequential Circuit Design: Flip flops (RS, Clocked RS, D, JK, JK Master Slave, T, Counters, Shift registers and their types, Counters: Synchronous and Asynchronous counters.

Unit- IV Computers: Basic Organization, Memory: ROM, RAM, PROM, EPROM, EEPROM, Secondary Memory: Hard Disk & optical Disk, Cache Memory, I/O devices

## 160- Object Oriented Programming Using 'C++'

**UNIT - I : Object Oriented Methodology:** Elements of Object Oriented programming, Objects, Classes,OOPs features. Classes & Objects: Specifying a Class, Creating Objects, Accessing Class members,

Defining member function, Outside Member Functions as inline, Accessing Member Functions within the class, Static data member, Access Specifiers: Private, Protected and Public Members.

**UNIT - II : CONSTRUCTORS & DESTRUCTORS**: Introduction, Parameterized Constructors, Constructor Overloading, Constructors with Default Arguments, Copy Constructor, Destructor, Order of Construction and Destruction, Static data members with Constructor and Destructors. OPERATOR OVERLOADING: Definition, Overloadable Operators, Unary Operator Overloading, Unary & Binary overloading, Rules for Operators Overloading.

**UNIT - III : DYNAMIC OBJECTS:** Pointers to Objects, Creating and Deleting Dynamic Objects: New and Delete operators, Array of Objects, Array of Pointers to Objects, Pointers to Object Members, this Pointer. INHERITANCE: Defining, Abstract classes, Single, Multilevel, Multiple, Hierarchical, Hybrid Inheritance, Constructor and Destructor in Derived Classes.

**UNIT - IV : VIRTUAL FUNCTIONS:** Need for Virtual Functions, definition, Pure Virtual Functions, Abstract Classes, Rules for Virtual Functions. EXCEPTION HANDLING: Exception Handling Model, List of Exceptions, Handling Uncaught Exceptions, Fault Tolerant Design Techniques, Memory Allocation Failure Exception, Rules for Handling Exception Successfully.

## 161- Operating System

UNIT - I: Structure of Operating System, Operating System functions, Characteristics of Modern OS. Process Management: Process states, Creation, Termination, Operations on Process, Concurrent process, Processes Threads, Multithreading, Micro Kernels CPU Scheduling: Schedulers, Scheduling Methodology, CPU Scheduling Algorithm: FCFS, SJF, RR, Priority Scheduling.

UNIT – II: Performance comparison : Deterministic Modeling , Queuing analysis, Simulators. Deadlock and Starvation: Resource Allocation Graph, Conditions for Dead Lock, Dead Lock Prevention, Dead Lock Detection, Recovery from Deadlock.

UNIT - III: Memory Management: Logical Vs. Physical Address Space, Swapping, Memory Management Requirement, Dynamic Loading and Dynamic Linking, Memory Allocation Method: Single Partition allocation, Multiple Partitions, Compaction, paging, segmentation, Segmentation with paging. Protection.

UNIT - IV: I/O Management: I/O hardware, I/O Buffering, Disk I/O, Raid, Disk Cache. File Management: File Management system, File Accessing Methods, File Directories, File Allocation Methods, File Space Management, Disk Space Management, Record blocking. Protection Mechanisms: Cryptography, Digital Signature, User Authentication.

## 162- Web Programming

Unit I Internet, Internet users and working, Information on Internet, Requirements for connecting to Internet, Basic Internet Terms, Introduction to world wide web, Evaluation of world wide web, basic features, web browsers, popular web browsers, web servers, HTTP, URL, Search Engines, Search Engines categories, how to use Search Engines, Searching criterion, Introduction to browsers, Working with e-mail, Parts of e-mail text, working with messages.

Unit II Java Script -Introduction , values and variables, operators, loops and various statements in java script, Date object, Math object, string object, window events, working with forms, document object, screen object, navigator object, images and animation, java script objects Declaration, definition, and referencing. Identifiers scope rules. Recursion. Arrays; declaration, allocation & accessing, sorting of

arrays, JavaScript objects : Math, String, Date, Number and Boolean. Documents, forms, Statements, Functions, Objects in Java scripts, events and event handling, arrays, FORMS, Buttons, Checkboxes, Text fields and text areas.

Unit-III Introduction to active server pages (ASP) : working of ASP, setup, ASP objects, file system object, session tracking & cookies. Accessing databases using ASP. XML: Introduction, Document type definition, XML Schemas, Document Object model, Presenting XML, Using XML Processors: DOM and SAX

Unit IV XML displaying an XML Document, Data interchange with an XML Document, advantages of integrating ASP & XML. Introduction to Java Server Pages (JSP): scripting standard actions, Directives. Custom tag libraries. JSP & XML case study: advantages of integrating JSP & XML.

## 163- Database Management System

UNIT- I : DBMS : Definition: Databases, DBMS, Problems with traditional file processing system, Objectives of the database systems, Three level architectures of DBMS, Component of DBMS, Database Administrator, Database Users, Data model, Different types of data models, Concepts of Hierarchical, Network Models.

UNIT-II : E-R Models : Basic Concepts, Entity, Attributes, Relation Ship, Mapping, Keys, Weak and Strong Entity Set, Problems on E-R Diagrams, Extended E-R Features: Specialization, Generalization, Aggregation, Problems on Reduction of an E-R Schema to Tables, Tabular representation of Strong, Weak entity Sets and Relationship Sets.

UNIT-III : Relational Model: Structure, Relational Algebra, Fundamental Operations, Set – Intersection, Natural Join, Division and Assignment Operation. Extended Relational Algebra Operations, Aggregate Functions.

UNIT–IV : Functional Dependency: Functional Dependency, Fully Functional Dependency, Partial Dependency, Transitive Dependency, Multi Valued Dependency. Normalization, Normal Forms ( 1NF, 2NF, 3NF, BCNF, 4NF, 5NF). Problems on Normal forms.

## 164- Applied Mathematics-II

UNIT - I : Set Theory: Set, Subsets operations on set, Venn diagram, algebra on sets, Cartesian product of sets, Binary relations, Properties of binary relation, Relation matrix and the graph of relation, Partial order relations, Equivalence relations, Equivalence Classes, Composition of relations.

UNIT - II : Functions - definition, types of function, Invertible functions composition of functions. Counting - Permutation, Combinations, The pigeonhole principle, recurrence relation, Mathematical Induction.

UNIT - III : Algebraic Structures Semi groups & groups: Binary operations, Semi groups, isomorphism and Homomorphism, Product and Quotient of semi groups, Groups, subgroups, products and Quotient of groups. Lattices: - Lattice concepts, isomorphic Lattices, Properties of lattices, Finite Boolean algebras.

UNIT - IV : Graph Theory: Basic concepts, types of graphs, Representation of graph in memory, Euler path and circuits, Hamiltonian Path and circuits. Trees:- Basic concepts, Libeled trees, Undirected trees.

**165- Practical-I Practical-I Based on Paper I &II**

**166- Practical-II Practical-II Based on Paper III &IV**

**167 - Practical-III  Practical-III Based on Paper V &VI**

# Bachelor of Science (B.Sc. (IT)) Semester-III

**168- Microprocessor and ALP**

UNIT-I An over view of 8085, Architecture of 8086 Microprocessor. Special functions of General purpose registers. 8086 flag register and function of 8086 Flags. Addressing modes of 8086. Instruction set of 8086. Assembler directives, simple programs, procedures, and macros. Assembly language programs involving logical, Branch & Call instructions, sorting, evaluation of arithmetic expressions, string manipulation.

UNIT-II Pin diagram of 8086-Minimum mode and maximum mode of operation. Timing diagram. Memory interfacing to 8086 (Static RAM & EPROM). Need for DMA. DMA data transfer Method. Interfacing with 8237/8257. 8255 PPI – various modes of operation and interfacing to 8086. Interfacing Keyboard, Displays, 8279 Stepper Motor and actuators. D/A and A/D converter interfacing.

UNIT-III Interrupt structure of 8086. Vector interrupt table. Interrupt service routines. Introduction to DOS and BIOS interrupts. 8259 PIC Architecture and interfacing cascading of interrupt controller and its importance. Serial data transfer schemes. Asynchronous and Synchronous data transfer schemes. 8251 USART architecture and interfacing. TTL to RS 232C and RS232C to TTL conversion. Sample program of serial data transfer. Introduction to High-speed serial communications standards, USB.

UNIT-IV Advanced Micro Processors - Introduction to 80286, Salient Features of 80386, Real and Protected Mode Segmentation & Paging, Salient Features of Pentium, Branch Prediction, Overview of RISC Processors.

**169- Data Structures**

UNIT - I : LINKED LIST : Linked List, Representation of Single, Double, Header, Circular Single and Double Linked list, All possible operations on Single and Double linked List using Dynamic representation, Polynomial Representation and its Manipulation.

UNIT - II : STACKS : Stacks terminology, Representation of Stacks in Memory, Operation on Stacks, Polish Notations, Translation of infix to postfix & prefix expression, Infix to Postfix Conversion, Evaluation of Postfix Expression, Recursion, Problems on Recursion, Quick Sort and Tower of Hanoi Problem.

UNIT - III : QUEUE : Representation of Queues in Memory, Circular Queue. Dequeue and Priority Queue. Operations of above Structure using Array and Linked Representation. SORTING AND SEARCHING: Selection Sort, Insertion Sort, Merge Sort, Efficiency of Sorting Methods, Big-O Notations. Hash Tables, Hashing Technique, Collision Resolution Technique.

UNIT - IV : TREES : Basic Terminologies, Representation of Binary Trees in Memory, Traversing of Binary tree, Binary Search Tree, Operation on Binary Search Tree, Heap Tree, Operation on Heap Tree, Heap Sort Method GRAPHS : Basic Terminologies, Definition and Representation of Graphs in Memory: Linked List and Matrix Representation. Traversing graphs : BSF, DFS Method.

**170- Data Communication & Network-I**

**Unit-I:-** Introduction to data communications and Networking:- Introduction, history, data communication and network architecture, protocols and standards, standards organization , layered network architecture, open systems interconnection , data communications circuits, serial and parallel

data transmission, circuit arrangements and data communication networks , alternate protocol suite. Signal , Noise , Modulation and Demodulation:- Introduction, signal analysis, Electrical Noise and Signal to Noise ratio, analog modulation systems , Information capacity, bits, Bit rate, Baud and Mary Encoding , digital modulation.

**Unit –II**: Transmission Media:- Introduction , Metallic cable Metallic transmission lines, transverse electromagnetic waves, characteristics , transmission line classifications, M.T line types, M.T. line equivalent circuit , Wave propagation on metallic transmission lines , metallic transmission line losses. Optical fiber Transmission media:- Introduction, Advantages and Disadvantages of optical fiber cables , Electromagnetic spectrum , O.F. Communication system block diagram, Optical fiber Construction , the physics of light, velocity of propagation, propagation of light through an Optical fiber cable, Optical fiber modes and classifications , O.F. Comparison , losses in optical fiber cables, light sources, light detectors , lasers Digital transmission:- Introduction, Pulse modulation, pulse code modulation, dynamic range, Signal Voltage-to-quantization Noise Voltage Ratio, Linear Versus Nonlinear PCM Codes, Companding, PCM Line Speed, Delta Modulation PCM & Differential PCM.

**Unit –III** Wireless Communication Systems:- Introduction, Electromagnetic Polarization, Rays & Wavefronts, Electromagnetic Radiation, Spherical wavefronts & the Inverse Square law, Wave Attenuation & Absorption, Optical Properties of Radio Waves, Terrestrial Propagation of Electromagnetic Waves, Skip Distance, free-Space Pathloss, Microwave Communication Systems, Satellite Communication Systems. Data Communication Codes, Error Control & data Formats:- Introduction, Data Communication Character Codes, Barcodes, Error Control, Error Detection, Error Correction, Character Synchronization. Data Communication Hardware, Data Communications Circuit, Line Control Unit, serial Interfaces.

**Unit – IV** Network Topologies & Connectivity Devices:- Introduction, Transmission Formats, Topologies, Collision & Broadcast Domains, Connectivity Devices, Standard Connectivity Device Logic Symbols Local Area Networks:- Introduction, IEEE Project 802, Access Control Methodologies, Medium access Control, LAN Data Link Layer, Logic Link Control Sublayer, MAC Sublayer, Ethernet.

## 171- Linux Operating System

**UNIT - I :** Logging In and Logging Out, Anatomy of Linux OS, Directory Structure, /usr Directory, File Types: User datafiles, System data files, Executable files. Naming files and directories, Spawning Processes. Shell: Creating User Account, Shell Program, bash shell, Changing shell prompt. Commands: Basic Syntax for a command, Exploring the Home Directory, ls, mkdir, rmdir, stat, cat, rm, mv, cp

**UNIT - II** : Editor: Vi editor. Hooking up Hardware Devices: Formatting a Floppy Disk, Gathering important system information. Backing Up and restoring the File System: Simple Backup, gzip, gunzip, tar. Printing files: Print Spool directory, Sending files to Printer.

**UNIT - III** : Sharing Files with other Users: Maintaining User Accounts, Changing Password, Creating Group Accounts, Granting Access to files, Changing File Ownership, Protecting Files, Making a File ReadOnly. Working with Processes: Types of processes, ps Command, Creating process, killing process, free command and top utility.

**UNIT - IV** : Managing Disk Space: df, du commands, Creating Additional Free Disk Space, Locating Unused Files, Setting System Clock. Communication Utilities: who, who am i, finger, mesg, write,

wall, talk, Creating a message of the day. X Window System, Graphical User Interfaces: KDE and GNOME Desktop Environment.

## 172- E-Commerce

UNIT - I : Introduction to e-Commerce, Scope of electronic commerce, definition, e-Commerce and Trade Cycle, e- Markets, Internet e-Commerce in perspective. Value chain, Supply chain, Porters value chain model, Inter organizational value chains.

UNIT - II : Business strategy in electronic age: Competitive advantages, Strategy, Porters model, First Movers advantages, Advantages using e-Commerce. Introduction to business strategy, Strategic implications of IT, Technology, Business environment, Business capability, Existing business strategy, Strategy formulation and implementation planning, e-Commerce implementation, e-Commerce evaluation.

UNIT - III : Business to Business e-Commerce: Inter organizational transactions, The credit transaction trade cycle, A variety of transaction, Pens and things, Electronics Market, Usage of e-Market, Advantages and disadvantages of e-Market, Future of e-Market, EDI, introduction, EDI and Business.

UNIT - IV : Business to Consumer Electronic Commerce: Consumer trade transaction, Internet e-Commerce, eShop, Other e-Commerce technologies, Advantages and disadvantages of comsumer e-Commerce. Elements of e-Commerce: elements, e-Visibility, e-Shop, Online payments, Internet e-Commerce security.

## 173- Statistical Methods

UNIT- I: Introduction - Definition of Statistics, Importance and scope of Statistics, Limitations of statistics, Distrust of Statistics. Statistical Data Collection - Primary and Secondary data, Methods of Collecting Primary data, Sources and Secondary Data, Census and Sample Investigation. Presentation of statistical Data - Classification, Tabulation, Frequency Distribution, Diagrams and Graphs. Frequency Distributions and

UNIT- II : Measures of Central Tendency - Frequency Distribution, Continuous Frequency Distribution, Graphic Representation of a Frequency Distribution Average or Measures of Central Tendency or Measures of Locations, Requisites for an ideal Measure of Central Tendency Arithmetic: Mean Median, Mode, Geometric Mean and Harmonic Mean, Weighted Average, Relationship amongst different Averages.

UNIT- III: Measures of Dispersion, Skewness and Kurtosis - Meaning and Significance of Dispersion, Methods of Measuring Dispersion - Range, Quartile, Mean Deviation, Standard Deviation, Coefficient of Skewness, Kurtosis, Coefficient of Dispersion, Coefficient of Variation.

UNIT- IV: Correlation and Regression - Definition of Correlation, . Scatter Diagram, Karl Pearson Coefficient of Correlation, Limits for Correlation Coefficient, Definition of Regression, Lines of Regression, Regression Curves, Regression coefficients, properties of Regression coefficients, Correlation Analysis vs. Regression Analysis.

## 174- Practical-I Based on Paper I &II

## 175- Practical-II Practical-II Based on Paper III &IV

## 176 -  Practical-III  Practical-III Based on Paper V &VI

# Bachelor of Science (B.Sc. (IT)) Semester-IV

**177- Software Engineering**

Unit I Introduction to Software Engineering : The evolving role of software, Changing Nature of Software, Software myths. A Generic view of process : Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models.

Unit II Process models : The waterfall model, Incremental process models, Evolutionary process models, The Unified process. Software Requirements : Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

Unit III Requirements engineering process : Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management. System models : Context Models, Behavioral models, Data models, Object models, structured methods.

Unit IV Design Engineering : Design process and Design quality, Design concepts, the design model

**178- Java Programming**

UNIT - I : Introduction to Java: -History of Java, features of Java, getting started with Java. Java programs:- Introduction of Application & Applets. Variables: -Variable naming, variable initialization, assign values, Rules of variables, Scope of variable. Operators: -Arithmetic, Assignment, Unary, Comparison, Shift, BitWise, Logical, Conditional, New, Special, Relational. Data types:-Integers, Char, String, Float etc. Typecasting: Tokens: -Java tokens Order of precedence of operators Streams: - Input and output.

UNIT - II : Creating a class & subclass: -Declaring a class, Naming class, Rules to assign Class & Subclass, Creating a new object, Class of an object. Data members: -Declaring data member, Naming variables, using class members. Methods: -Using data members, Invoke a method, passing arguments to a method, calling method. Access Specifier & Modifiers: -Public, Private, Protected, Static & Final. Overloading: -Method overloading, Constructor overloading. Java class library: - Different types of classes. Decision making & loops:-If-then-else, Switch,? : operator, While-loop, do-while loop, for. Array: -Creating an array, onedimensional array, two-dimensional array. String: -String array, string methods. Inheritance: -Single & multiple inheritances Interfaces: -Defining interfaces, extending interfaces, implementing interfaces.

UNIT - III : Packages: -Java API packages, creating packages, accessing packages, adding a class to packages. Import statement: - Introduction & implementation of import statement. Applets:-Introduction to Applets & Application, how applets application are different creating An applet. Applets life cycle, designing a web page, creating an executable applet, running the applet, applet tags, passing a parameter to applet, HTML tag, Converting applet to application. Threads:-Overview of threads, single & multiple threads, lift cycle of threads, stopping & blocking threads, working with threads, priority to thread, synchronization. Exceptions & Errors:-Introduction, types of error, exception, syntax of exception, handling techniques, exception for Debugging.

UNIT - IV : Event: -Event driven programming, handling an (AWT) events. Graphic class:-Introduction, the graphic classes, drawing & filling of lines, rectangle, circle & ellipse, arcs, polygons,

text & fonts, creating a font class, font objects, text, coloring object. Streams:-Introduction, Abstract stream classes, file input & output. AWI Applications: -Creating a GUI using AWT toolkit, using component class, frames. Components & Control: -Textfield, textarea class, label, button, choice, list, checkbox, class, and combo. Menus: -Creating a popup menus. Image: - Type of image, Properties of an image, Displaying an image. Layouts: -Using Window Listener interface, Different types of Layout, Layout manager, Flow manager, Grid manager. Container: -Different types of container (Frame, Dialog, Panel)

## 179- Data Communication & Network-II

Unit-I Communication Architecture, Protocols & Architecture: Protocols, The Layers Approach, OSI Model, TCP/IP protocol suite, System Network Architecture. Internetworking: Principles of Internetworking, Bridges, Routers, Repeaters, Gateways, Connection Oriented Internetworking, Connectionless Internetworking, Connectionless Internetwork Protocol, Router-level protocol.

Unit II Transport Protocols- Transport services, Protocol Mechanism, Network services, ISO Transport Standards, TCP, UDP, TCP and UDP Packet format, Lightweight Transport Protocol.

Unit III Session Services & Protocols- Session Characteristics, OSI Session Services, Definition, OSI Session Protocol definition. DNS, FTP, HTTP.

Unit IV Digital Network, ISDN & Broadband ISDN : Overview of ISDN, Architecture and Interfaces of ISDN, Transmission structure, User Access, ISDN protocols, Broadband ISDN(B-ISDN).

## 180- Oracle

Unit I Introduction to Oracle - Relational database management system (RDBMS), Codd's Rules for RDBMS, Oracle as multiuser system, Logging and Logging out of Oracle, Database Administrator (DBA) and its Role, Creation of user and Password. Introduction to Structured Query language (SQL) – History and standardization of SQL, benefits of SQL, elements of SQL, Languages, Database objects, Reserve words, Keywords. Data types – Char, Varchar, Date, Number, Long, Raw and Long raw.

Unit II SQL Command – DDL command, DML command, DRL command, Aggregate function, Clauses, Set operator, Predicates, Join, Sub queries, Views. Simple reports commands. PL/SQL - Introduction to PL/SQL, Advantages of PL/SQL, PL/SQL block structure, Character Set, Literals, PL/SQL data type, Variables, Control and loop statements, Loops and Labels.

Unit III Cursor – PL/SQL Cursor, Explicit Cursors, Implicit Cursors. Exception Management - User defined, predefined exceptions, subprograms and packages - procedures, functions, package specification, body, calling sub programs, advantages of packages, cursers in packages.

Unit IV Database Triggers & Built in Packages - Database triggers-syntax, parts, statement, body, restriction, types. Built in packages – DBMS standard. DBMS OUTPUT - Collection, member functions and procedures, PL/SQL table and records, declaration, referring, maintaining row count, insertions, deletions, nested tables, varying, arrays, initialization, declaration, varrays, member functions and procedures.

### 181- Compiler Construction

UNIT - I : Compilers and translators, need, the structure of a compiler, Lexical Analysis, Syntax analysis, Intermediate code Generation, Optimization, Code Generation, Book keeping, Error Handling

UNIT - II : High Level programming languages, Definitions of programming languages, The lexical and syntactic structure of a language, Data elements, structures, Operators, Assignment Statements, Data Environments, Parameter transmission, Storage management.

UNIT - III : The role of the lexical analyzer, Approach to the design of lexical analyzer, Implementation of lexical analyzer, Context free grammars, Derivations and parse trees, Ambiguous grammar.

UNIT - IV : Parsers, Shift-reduce parsing, Operator precedence parsing, Top-down parsing, predictive parsers, Symbol Table , Code Optimization: The principal source optimization, Loop optimization, The DAG representation of basic blocks, Code Generation : A machine model, a simple code generator, Register Allocation and assignment.

### 182- Numerical Methods

UNIT - I : Roots of Non-Linear Equations : Algebraic equation, Polynomial equation, Transcendental equation, Iterative method, Starting & Stopping Iterative method, Bisection Method, False Position method, Newton Raphson Method: Secant Method, Determining all possible roots, Multiple roots of polynomial, Complex Roots using Muller's Method.

UNIT - II : Solution to Linear Equations Existence of solution, Gauss Elimination Method, Gauss elimination with pivoting, Gauss Jordan Method, Round off errors and refinement, m Conditioned system, Matrix inversion method.

UNIT - III : Linear interpolation, Lagrange Interpolation, Spline Interpolation, Interpolation with equidistant points, Least Square regression Fitting, Transcendental equations, Multiple linear regression, m conditioning in Least square

UNIT - IV : Integration & Differentiation : Trapezoidal Rule, Simpson 1/3 Rule, Simpson 3/8 rule, Gaussian Integration, Solution to differential equation (using Runge-Kutta second and fourth order methods, Multistep method for differential equations (Milne-Simpson method, Adams-bashforth

### 183- Practical-I Practical-I Based on Paper I &II

### 184- Practical-II Practical-II Based on Paper III &IV

### 185 - Practical-III Practical-III Based on Paper V &VI

# Bachelor of Science (B.Sc. (IT)) Semester-V

**186- Software Project Management**

Unit I Managing Software Project: Process & Project Management, Project Management and the CMM, Project Management at Infosys, Introduction to CMMI, PCMM, The Project Planning Infrastructure: The process data base, process capability Baseline, Process Assets and the Body of Knowledge System.

Unit II Process Planning: The Information System Development Process, Requirement Analysis, Requirement Change Management, Effort Estimation & Scheduling: Estimation and Scheduling Concepts, Effort – Estimation, Scheduling.

Unit III Quality Planning: Quality Concepts, Quantitative quality Management Planning, Defect Prevention Planning. Risk Management: Concepts of Risks and Risk Management, Risk Assessment, Risk Control.

Unit IV Measurement and Planning: Concepts in measurement, Measurements, Project tracking. Project Management Plan: Team Management, Customer Communication and Issue Resolution, Structure of the Project Management Plan.

**187- Dot Net Framework and C#**

Unit-1 The .Net framework: Introduction, The Origin of .Net Technology, Common Language Runtime (CLR), Common Type System (CTS), Common Language Specification (CLS), Microsoft Intermediate Language (MSIL), Just-In –Time Compilation, Framework Base Classes.

Unit-II C -Sharp Language (C#): Introduction, Data Types, Identifiers, Variables, Constants, Literals, Array and Strings, Object and Classes, Inheritance and Polymorphism, Operator Overloading, Interfaces, Delegates and Events. Type conversion.

Unit-III C# Using Libraries: Namespace- System, Input-Output, Multi-Threading, Networking and sockets, Managing Console I/O Operations, Windows Forms, Error Handling.

Unit-IV Advanced Features Using C#: Web Services, Window Services, Asp.net Web Form Controls, ADO.Net. Distributed Application in C#, Unsafe Mode, Graphical Device interface with C#. .Net Assemblies and Attribute: .Net Assemblies features and structure, private and share assemblies, Built-In attribute and custom attribute. Introduction about generic.

**188- Network Security**

Unit I Introduction, Security Concepts, Threats and Risks, Attacks – Passive and Active, Security Services, Confidentiality, Authentication, Non-Repudiation, Integrity, Access Control, Availability, Model for Internetwork Security, Internet Standards and RFCs Access Control Mechanisms ,Access Matrix, HRU, TAM, ACL and capabilities

Unit II Access Control Models, Chinese Wall, Clark-Wilson, Bell-LaPadula, Non- Interference and Role Base Model. Cryptography, Secret Key and Public Key Cryptosystems, Symmetric Ciphers, Block Ciphers and Stream Ciphers, DES, IDEA and Key Escrow, RSA and ElGamal.

Unit III Secure Hash and Key management, Digital Signature and Non-repudiation, cryptanalysis. Network Security, Objectives and Architectures, Internet Security Protocols, IP encapsulating Security Protocol, Network and Transport Layer Security.

Unit IV Network Security Applications, Authentication Mechanisms: a) Passwords, b) Cryptographic authentication protocol, c) Smart Card, d) Biometrics,e) Digital Signatures and seals, f) Kerberos, g) X.509 LDAP Directory. Web Security : a) SSL Encryption b) TLS, SET, E-mail Security, PGPs / MIME, IP Security, Access and System Security , Intruders, Intrusion Detection and Prevention , Firewall a) Hardware Firewall b) Software Firewall c) Application Firewall d) Packet Filtering. e). Packet Analysis, Proxy Servers, Firewall setting in Proxy, ACL in Proxy

## 189- Data Warehousing

Unit I Introduction, Definition, Components, Warehousing databases, Users, Advantages, Features, Data Granularity, Information Flow Mechanism, Metadata, Classes of Data, Lifecycle of Data, Data Flow. Architecture of Data Warehouse, characteristics, Goals, Data Marts, Building Data Marts, Pushing and Pulling Data,

Unit II Data Warehousing Schema, Dimensional Modeling, Star Schema, Snowflake Schema, Aggregate Tables, Fact Constellation Schema, Data Modeling, Dimensional Modeling: Dimension Table, Fact Tables, Fatless Fact Tables, Updates to Dimension Tables, other types of dimension table, Performance of Data Warehouse. ELT Process: Data Extraction, Data Transformation, Data Loading, Data Quality

Unit III Data warehousing design Review, Developing data warehouse, Testing, Monitoring, Tuning, Feedback Loops. OLAP in Data warehouse: OLAP, ROLAP, HOLAP, Multidimensional Analysis, OLAP Functions, OLAP Application\s, OLAP Models, OLAP Considerations, Tools and Products, Data Design, Administration and Performance, OLAP Platforms

Unit IV Building Data Warehouse: Problem Definition, Success Factors, Requirement Analysis, Planning, Design Stage, Building and Implementation of Data Marts, Building Data Warehousing, Backup and Recovery, quality Frameworks, Operating warehouse, Recipe for Successful Warehouse, Pitfalls, factor,

## 190- VB Programming

UNIT-I : Working with Visual Basic Window Components: Menu Bar, Tool Bar, Project Explorer Window, Form Layout Window, properties Window, Toolbox, Code Editor Window Working with Forms: Properties, Events, Methods Working with Basic Controls:Label, CommandButton, TextBox, OptionButton, Frame, CheckBox, ListBox, ComboBox, Image, Scroll, Picture, Timer, DriveListBox, DirListBox, FileListBox and Shape Controls. Basic Programming Fundamentals: Variables, Data types, Constant, Conversion Function. Scope of Variable: Public, Private Static. Operators: Logical, Arithmetic, Concatenation, Comparison. Decision Structure: If.. Then, If..Then..Else, Select Case.. End Case. Loop Structure: Do..While, While.. Wend, For.. Next, With..EndWith. DoEvents()

UNIT-II : Arrays: Dynamic Array, Preserve and Control arrays. Procedure: General procedure, General Methods for Passing Arguments to a Procedure, Functions: User-Interaction, String, Math, Date, Conversion Functions. Modules: Form, Standard.

UNIT-III : Menus: Creating, Adding Menu Items, Creating Shortcut, Adding Separators Bars, Submenus, Code for Menus. Creating Popup Menu: System, Custom. Database Handling: Database Concepts, Creating and Accessing Database, Using Data Control. Using DAO: Creating Search Programs, Numeric Search and Complex Search Programs.

UNIT-IV : Using ADO Data Control, Data Link, ODBC Data Source name, Using Connection String, Creating Navigating buttons. Working with Advanced Data Controls : DataList Control, DataCombo Control, DataGrid Control and Msflexgrid Control. Handling Errors : Run Time, Trapping and Handling Error, ERR Object. Data Environment and Data Reports.

## 191- Graph Theory

Unit 1 : Graphs and operations on graphs Definition and elementary results, Types of graphs, Isomorphism, Matrix representation of graphs: Adjacency matrix and incidence matrix, Subgraphs and induced graphs, Complement of a graph, Self complementary graphs, Union, intersection of graphs, Ring sum of two graphs.

Unit 2 Connected Graphs Definitions: walk, trail, tour, path and circuit, Definitions of connected, disconnected graphs, Dijkstra's shortest path algorithm, Connectivity: cut-vertex, vertex connectivity.

Unit 3 : Tree Graphs Tree : Definition, Theorem : A tree with n vertices has n -1 edges, Theorem : A connected graph G with n vertices and n – 1 edges is a tree, Theorem : A graph with n vertices is a tree if and only if it is circuit free and has n – 1 edges, Theorem : A graph G is a tree if and only if it is minimally connected, Center of a tree, Spanning tree: Definition and examples, Fundamental circuit and cut – set : Definition, Binary trees and elementary results, Kruskal's algorithm.

Unit 4 : Directed Graphs Definition, types of directed graphs, Directed (rooted) trees, arborescence and Polish notation, Isomorphism of digraphs, Connectedness in digraphs, Euler digraph, Network and flows: Definition, examples, Maximal flow algorithm.

## 192- Practical-I Practical-I Based on Paper I &II

## 193- Practical-II Practical-II Based on Paper III &IV

## 194 - Practical-III Practical-III Based on Paper V &VI

# Bachelor of Science (B.Sc. (IT)) Semester-VI

**195- Enterprise Resource Planning**

Unit I INTRODUCTION Business needs and ERP, ERP as an overview, entries as an overview, Benefits of ERP, ERP and related technologies, ERP architecture, business process reengineering, data warehousing, data mining, on line analytical processing supply choice management.

Unit II ERP: Client server architecture and ERP, ERP implementation life cycle, implementation m~hodologies, ER? implementation – The hidden cost, organizing implementations, vendors, consultants and users, contracts with vendors, consultants and employees, project management and monitoring. After ERP implementation.

Unit III THE BUSINESS MODULE : Business models in an ER? package, finance, manufacturing human resource, plant maintenance, materials management, quality management sales and distribution.

Unit IV Selection of ERP, SWOT analysis of various ER? products supply chain enabled ERP. ER? and Electronic Data Interchange (EDI) integration, ERP in manufacturing and non manufacturing industries.

**196- Advance Java Programming**

Unit I Core Java: Introduction, Operators, Data types, Variables, Arrays, Control Statements, Methods & Classes, Inheritance, Package and Interface, Applets Java swing: Creating a swing Applet and Application, Programming using Panes, Pluggable Look and feel, Labels, Text fields, Buttons, Toggle Buttons, Checkboxes, Radio Buttons, View Ports, Scroll Panes, Scroll Bars, List, Combo Box, Progress bars, Menus and Toolbars, Layered Panes, Tabbed Panes, Split Panes, Layouts, Windows, Dialog Boxes, Inner frame.

Unit II JDBC: The connectivity Model, JDBC/ODBC Bridge, Java.sql package, connectivity to remote database, navigating through multiple rows retrieved from a database.

Unit III Java Beans: Application Builder tools, The bean developer kit(BDK), JAR files, Introduction, Developing a simple bean, using bound properties, The java Beans API, Session Beans, Entity Beans, Introduction to Enterprise Java Beans(EJB), Introduction to RMI(Remote Method Invocation): A simple client-server application using RMI.

Unit IV Java Servlets: Servlet basic, Servlet API basic, Life cycle of a Servlet, Running Servlet, Debugging Servlet, Thread-safe Servlet, HTTP Redirects, Cookies, Introduction to Java server pages(JSP).

**197- Cloud Computing**

Unit I Introduction to Cloud Computing, The Evolution of Cloud Computing, Hardware Evolution, Internet Software Evolution, Server Virtualization, Web Services Deliver from the Cloud, Communicationasa-Service, Infrastructure-as-a-Service, Monitoring-as-aService, Platform-as-a-Service, Softwareas-aService, Building Cloud Network

Unit II Federation in the Cloud, Presence in the Cloud, Privacy and its Relation to Cloud-Based Information Systems, Security in the Cloud, Common Standards in the Cloud, End-User Access to the Cloud Computing

Unit III Introduction, Advancing towards a Utility Model, Evolving IT infrastructure, Evolving Software Applications, Continuum of Utilities, Standards and Working Groups, Standards Bodies and Working Groups, Service Oriented Architecture, Business Process Execution Language, Interoperability Standards for Data Center Management, Utility Computing Technology, Virtualization, Hyper Threading, Blade Servers, Automated Provisioning, Policy Based Automation, Application Management, Evaluating Utility Management Technology, Virtual Test and development Environment, Data Center Challenges and Solutions, Automating the Data Center

Unit IV Software Utility Application Architecture, Characteristics of an SaaS, Software Utility Applications,Cost Versus Value, Software Application Services Framework, Common Enablers, Conceptual view to Reality, Business Profits, - Implementing Database Systems for Multitenant Architecture

## 198- Data Mining

Unit I Data Mining: Introduction, Definitions, KDD Vs Data Mining, DBMA Vs Data Mining, Data Mining Problems, Data Models, OLAP, User Perspectives, Issues, Challenges, Trends, Application Areas and Applications Frequent Pattern Mining: Basic Problem Definition, Association Rule, Mining Association Rule, Applications, Variations, Interestingness, Methods of Discovering Association Rule, Priori Algorithm, Frequent Itemset Mining (FIM) Algorithm, Comparison of FIM Algorithm, Optimal FIM Algorithm, Incremental Mining, Conciseness of Results, Sequential Rule

Unit II Classification, Definition, Applications, Evaluations of Classifiers, Issues, Classification Techniques, Optimal Classification Algorithm, Regression Decision Tree, Tree Construction Principal, Best Split, Speliting Indices, Splitting Criteria, Decision Tree Construction Algorithm

Unit III Clustering, Definition, Applications, Measurement of Simplicity, Evaluation of Clustering Algorithm, Classification of Clustering Algorithm, Partition Method, Hierarchical Method, Density Base Method, Grid Base Method, Outlier Detection,

Unit IV Partition Discovery, Relational Data, Transactional Data, Distributed Data, Spatial Data, Data Stream, Time Series Data, Text and Web Data, Multidimensional Data

## 199- Animation Techniques

Unit I What is mean by Animation, Why we need Animation, of Animation, Uses of Animation, Types of Animation, Principles of Animation, Some Techniques of Animation, Animation on the WEB, 3D Animation, Special Effects, Creating Animation.

Unit II Creating Animation in Flash: Introduction to Flash Animation, Introduction to Flash, Working with the Timeline and Frame-based Animation, Working with the Timeline and Tween-based Animation, Understanding Layers, Actionscript.

Unit III 3D Animation & its Concepts, Types of 3D Animation, Skeleton & Kinetic 3D Animation – Texturing & Lighting of 3D Animation, 3D Camera Tracking, Applications & Software of 3D Animation.

Unit IV Motion Caption, Formats, Methods, Usages, Expression, Motion Capture software's, Script Animation Usage – Different Language of Script Animation Among the Software. Concept Development, Story Developing, Audio & Video, Color Model, Device Independent Color Model, Gamma and Gamma Correction, Production Budgets, 3D Animated Movies.

**200- Operation Research**

Unit 1 Overview of operations Research: OR models, OR Techniques Linear Programming : Introduction, Graphical solution; Graphical sensitivity analysis, The standard form of linear programming problems, Basic feasible solutions, unrestricted variables, simplex algorithm , artificial variables, Big M and two phase method, Degeneracy, alternative optima, unbounded solutions, infeasible solutions.

Unit 2 Dual problems: Relation between primal and dual problems – Dual simplex method Transportation model: starting solutions. North West corner Rule, lowest cost method, Vogels approximation method – Transportation algorithms – Assignment problem – Hungarian Method.

Unit 3 Network Models: Definitions, CPM and PERT, Their Algorithms Integer Programming : Branch and Bound Algorithms cutting plan algorithm. Dynamic Programming: Recursive nature of dynamic programming, Forward and Backward Recursion.

Unit 4 Assignment Problem – Zero-One Programming Model for Assignment Problem, Types of Assignment Problem, Hungarian Method, Branch and Bound Technique for Assignment Problem

**201- Practical-I Practical-I Based on Paper I &II**

**202- Practical-II Practical-II Based on Paper III &IV**

**203 - Practical-III Practical-III Based on Paper V &VI**

# Master in Computer Science (M.Sc. (Comp. Science)) Semester-I

## 204- Discrete Mathematical Structure

Unit-1 : Fundamental – Sets and Subsets, operations on sets, sequence, Division in the integer, Matrices, Mathematics Structures. Logic-Proposition and Logical Operation Conditional Statements, Methods of Proof, Mathematical Induction, Mathematics Logic- Statements and Notation, Connectives ,Normal Forms ,The Theory of Interface for the statement Calculus ,Inference Theory of the Predicate Calculus,

Unit-2 : Counting- Permutation, Combination, The pigeonhole Principle, Recurrence Relations. Relational and Digraphs- Product sets and Partitions, Relations and Digraphs, Paths in Relations and Digraphs Properties of Relations, Equivalence Relations, Computer Representation of Relations and Digraph, Manipulation of Relations, Transitive Closure and Warshall's Algorithms. Functions-Definition and Introduction, Function for Computer Science, Permutation Functions, Growth of Functions.

Unit-3 : Graph Theory : Basic Concept of Graph Theory, Euler Paths and Circuits, Hamiltonian Paths and Circuits. Other relations and Structure- Partially Ordered Sets, Lattices Finite Boolean-Algebra, Functions of Boolean Algebra's, Boolean function as Boolean Polynomials. Tree-Introduction Unidireted Tree, Minimal Spanning Trees.

Unit-4 : Semigroups and Groups: Binary Operations Revisited, Semigroups, Products and Quotations of Groups. Introduction to computability –Languages Finite –State Machines, Semigroup, Machines and Language.

## 205- Programming in Java

Unit-1 : Java and Internet, Features of java: security, portability, multithreading, etc, Bytecode, Datatypes, variables and Arrays, Operators, Classes : declaring objects, methods, constructor, overloading constructor, garbage collection, finalize() method, static variable and method, final variable, command line argument. Inheritance: super keyword, final with inheritance. Packages and Interfaces. Exception handling : Overview, types, Uncaught exception, try -catch block, multiple catch, nested try, throw, throws, finally, bulit-in and user- defined exception. Multithreading : Life Cycle, Thread class and Runnable Interface, isAlive(), join(),Priorites, Synchronization : sleep() , run(). Interthread communication : wait(), notify(), notifyAll(), deadlock. String Handling.

Unit-2: Wrapper classes, Applet: Applet Class, Architecture, Life Cycle, Display methods, HTML APPLET Tag, Passing parameter to Applet AWT : working with Windows, Controls, Layout Manager, Menus. Swings. Event handling.

Unit-3: JDBC : Architecture, JDBC-ODBC bridge driver, SQL Package, ResultSet and its methods. Networking : Socket, Reserve socket, Internet Addressing, InetAddress, TCP/IP client socket, TCP/IP server socket, URL, URL Connection, Datagram. RMI : Introduction, Architecture, Remote Interface, java.rmi. server package, class naming, creating Rmi server and client ,transmitting files using rmi, client side callback, RMISECURITYMANAGER class, RMI Exception, Stub and Skeleton.

Unit-4: Servlet : Life Cycle, Tomcat, javax. servlet package, reading servlet parameter, javax.servlet.http package, handling http request and response with HTTPGET and HTTPPOST,

cookies,session tracking. JSP : Introduction, Types of JSP tags, Application using JSP and Servlet. JavaBeans : Advantages of Beans, BDK, JAR files, Introspection, Developing Beans using BDK

## 206- Digital Electronics and Microprocessor

Unit-1 : Number System and Data Representation Number System : Binary, Octal, Decimal and Hexadecimal number system and their inter conversion. Binary Codes : BCD, Excess3 , Parity, Gray, ASCII, EBCDIC codes and their advantages and disadvantages. Data Representation : Positive , negative ,maximum and minimum number representation (related to 8 bit number), real number representation, underflow, overflow , range and accuracy. Binary Arithmetic : Binary addition, decimal subtraction using 9's and 10's compliment, binary subtraction using 1's and 2's compliment, multiplication and division. Logic gates: Truth table, properties and symbolic representation of NOT, AND, OR, NOR , NAND, EXOR, EXNOR gates. NOR and NAND gates as a universal gates .

Unit-2 : Boolean Algebra: Laws and Identities of Boolean algebra, DeMorgan's Theorem , use of Boolean Algebra for simplification of logic expression, K-Map for 2,3,4 variables, simplification of SOP and POS logic expression using K-Map. Combinational circuits: Half adder, Full Adder, Parallel adder, Half subtractor, Full Subtractor, 4-bit binary adder subtractor, Multiplexer, Demultiplexer, Decoder, Encoder, Parity detector.

Unit 3 : Sequential Circuits : Flip-Flops : Construction and working of RSFF, JKRSFF, DFF, TFF, JKFF, and JKMSFF . Counters : Construction and working of asynchronous, synchronous, up-down counter, shift registers and their types, Ring counter, Jonhson counter with their time diagram.

Unit-4 : Architecture of 8086 and Assembly Language Programming Block diagram of 8086, Pin diagram of 8086, Addressing modes, Instruction set: Data transfer, Arithmetic, Logical, String manipulations, Control Transfer, Unconditional branch, Conditional branch, Flag, Processor control. Assembler directives and operators, simple assembly programs.

## 207- Advanced DBMS and Administration

Unit-1 : Relational Database design: Functional dependencies, and Normalization Normal forms based on primary keys (1 NF, 2 NF, 3 NF, BCNF, 4 NF, 5 NF) Loss less joins and dependency preserving decomposition Query Processing: Query Processing Stages, Query Interpretation, Equivalence of Expressions, Query Resource Utilization, Query Execution Statistics, Query Execution Plan, Estimation of Query Processing Cost, Table Scan, Sample Index Access, Fill Factor, Multiple Index Access, Methods for Joining Tables (Nested Loop, Merge Join, Hybrid Join, Multiple Join) Structure of a Query Optimizer

Unit-2 : Transaction Processing & Concurrency Control: Concept and definition of transaction, ACID properties, serializibility, Prioritization, states of transaction, Types of failure, desirable properties of transaction schedules and recoverability, serial usability of schedules, levels of transaction consistency, deadlocks, long duration transactions, transaction performance, transaction processing as implemented in contemporary database, management system. Concurrency Control, locking techniques, techniques based on time-stamp ordering, multiple granularity. Crash Recovery: failure classification, recovery concepts, database backup, recovery concepts based on deferred update and on immediate update. Shadow paging, check points, on-line backup during database updates, crash recovery techniques. Client/Server database: Evolution of client concept, Client/Server environment, characterization of Client/Server computing. Functions of clients server , application partitioning, the two-layer and threelayer architectures, communication between clients and servers.

Unit-3 : Oracle Database Architecture and Administration: Oracle database architecture, Design, Creation, Migration and Management of Oracle Databases and related database schemes, Data Dictionary views and standard package Maintaining the control, Redo Loa files, Managing Tablespaces and Data Files, Storage structure and relationships, Managing rollback segment, Managing tables, Indexes, Managing data Integrity, Managing password security and resources, Managing users, Privileges, roles. Oracle Backup and Recovery Strategies: Backup and recovery considerations, Oracle recovery structure and processes, Oracle backup and recovery configuration, Physical backup, Complete recovery of an Oracle database, Incomplete recovery of an Oracle database with Archiving, Oracle Export / Import utilities, Oracle standby database.

Unit-4 : Oracle Tuning and Troubleshooting:Oracle performance tuning methodology,'Oracle alert and trace files, Tuning the shared pool, Buffer Cache, Redo Log buffer, Database configuration and I/O issues, Using Oracl Blocks efficiently, Optimizing sort operations, Rollback segment tuning, Monitoring and detecting lock contention, SQL issues and tuning considerations for different application. Integrity, Security: Need for Database Integrity, Integrity Constraints, Non-Procedural and Procedural Integrity Constraints Specifications in SQL, Introduction to Database Security issues, Authorization and use.

**208- Based on theory paper- 1T3 and 1T4**
**209 - Based on theory paper- 1T3 and 1T4**
**210 - Seminar 1**

# Master in Computer Science (M.Sc. (Comp. Science))
# Semester-II

## 211- Windows Programming using VC++

Unit-1 : Windows, Visual C++, Application Frameworks Fundamentals and MFC Libraries View Class. Introduction, MFC, ATL and WFC, Windows Programming Model, Components, Application Framework, MFC Library, Event Handling, Mapping Modes and Scrolling Views, Graphic Device Interface, Colors and Fonts, Modal Dialog and Windows Common Control, Modeless Dialog and Windows Common Dialog, ActiveX Controls and Internet Explorer Common Controls, Win32 Memory Management, Bitmaps, Message Processing and Multithreaded Programming.

Unit-2 : Document View Architecture : Menus, Keyboard Accelerators, Rich Edit Control and Property Sheets, Tool bar and Status Bars, Reusable Frame Window Base Class, Separating the Documents from its View, Reading and Writing Documents- SDI applications, MDI applications, Printing and Print Preview, Splitter Windows and Multiple Views, Context-Sensitive Help, DLL's, MFC Programs without Documents or View Classes

Unit-3 : Active X: COM, Automation and OLE : Component Object Model, Automation, Uniform Data Transfer- Clipboard Transfer and OLE, Drag and Drop, Structured Storage, OLE Embedded Components and Containers, Introducing the Active Template Library, ATL and ActiveX Controls.

Unit-4 : Database Management: Database Management with Microsoft ODBC, Database Management with Microsoft Data Access Objects, OLE DB Templates. Programming for the Internet: TCP/IP, Winsock, WinInet, Programming the Microsoft Internet Information Server, ActiveX document Servers and the Internet, Introducing the Dynamic HTML, Visual C++ for Windows CE.

## 212- Theory of Computation and Compiler Construction

Unit-1 : Finite Automation and Regular Expression : Finite State systems, Basic Definitions, Non - deterministic finite Automata, Finite Automata with moves, Regular Expressions, Two way finite automata, Finite automata with output, Application on Finite Automata. Properties of Regular Sets : The pumping lemma for Regular Sets, Close properties of Regular sets, Decision Algorithms for Regular Sets. Context Free Grammars : Motivation and Introduction, Context Free Grammar, Derivation Tree, Simplification of context Free Grammars, Chomsky Normal form, Greibach normal form, The existence of inherently ambiguous context free languages. Properties of Context free languages : The pumping lemma for CFL's , Closure properties of CFL's, Decision Algorithm for CFL's

Unit-2 : Push Down Automata : Informal description, Definitions, Push – Down Automata & Context free languages. Turing Machine : Introduction, The Turing Machine Model, Computable languages and functions , Techniques Turing Machine construction, Modification of Turing Machines, Churchs Hypothesis, Turing Machine as enumerators, Restricted Turing Machine equivalent to the basic model. Undecidability : Problems, properties of recursive and recursively enumerable problem, Turing Machine and undecidable problem, Rice theorem, Tool for proving CFL undecidable, Greibach's Theorem. The Chomsky : Regular Grammars, Unrestricted Grammars, Context – Sensitive languages, Relation between classes of languages.

Unit-3 : Introduction to Compilers : Compilers and translators, need, the structure of a compiler, Lexical Analysis, Syntax analysis, Intermediate code Generation, Optimization, Code Generation, Book keeping, Error Handling, Compiler writing tools. Basic parsing Techniques: Parsers, Shift-reduce parsing, Operator precedence parsing, Top-down parsing, predictive parsers, automatic construction of efficient parsers : LR parsers the canonical collection of LF (O) items, constructing SLR parsing tables, constructing LALR parsing tables, Ambiguous grammar.

Unit-4 : Syntax directed translation : syntax directed translation schemes, implementation, intermediate code,postfix notation, parse tree and syntax trees, tree- address code, quadruple, triple, translation of Symbol Table: Data Structure, Representation of Scope Information, Code Optimization: The principal source optimization, Loop optimization, The DAG Representation of basic blocks, Value number and algebraic laws, Global data-flow analysis. Code Generation : Object Programmers Problems in code generation, A machine model, a simple code generator, Register Allocation and assignment, Code Generation from DAG's Peephole Optimization.

## 213- Computer Architecture and Organization

Unit-1 : Principle of computer design : Software, hardware interaction, layers in computer architecture, central processing and machine language instruction, addressing modes, instruction types, instruction set selection, instruction and execution cycle.

Unit-2 : Control Unit : Data path and control path design, microprogramming v/s hardwired control, pipelining in CPU design, RISC v/s CISC, superscalar processors.

Unit-3 : Memory subsystem : Storage technologies, memory array organization, memory hierarchy, interleaving , cache memory and virtual memory including architectural aids to implement these.

Unit-4 : Input/ Output Processing : Bus Interface, Data transfer techniques, I/O interrupts and channels,. Performance evaluation : SPECmarks , Transaction Processing Benchmarks.

## 214- Computer Graphics

Unit-1 : Introduction of computer Graphics and its applications, Overview of Graphics systems, Video display devices, Raster scan display, Raster scan systems, video controller, Raster scan display processor, Random scan display, random scan systems, color CRT monitor, Flat panel display, Interactive input devices, Logical classification of input devices, Keyboard, mouse, Trackball and spaceball, Joysticks, Image scanner, Light pens, Graphics software, Coordinates representations, Graphics functions.

Unit-2 : Line drawing algorithms, DDA, Bresenham's, Circle generating, Mid-point circle algorithm, Ellipse generating, Polygon , Scan-line polygon fill, Boundary fill.

Unit-3 : Basic transformation's, Translation, Rotation, Scaling, Matrix representation's & homogeneous coordinates, Composite transformation's, Reflection, Two dimensional viewing, Two dimensional clipping, Line, Polygon, Curve, Text. 3D-transformation, Projection, Viewing, Clipping. Spline representation, Cubic spline, Bezier curve, Bezier surfaces, Beta spline, B-spline surfaces, Bspline curve, Hidden surfaces, Hidden lines, Z-buffer.

Unit-4 : Fractal's geometry Fractal generation procedure, Classification of Fractal, Fractal dimension, Fractal construction methods. Color models, XYZ, RGB, YIQ, CMY & HSV, Shading algorithms, Shading model, Illumination model, Gouraud shading, Phong shading.

**215- based on theory paper- 2T1 and 2T2**
**216 - 2P2 based on theory paper- 2T3 and 2T4**
**217- Seminar 2**

# Master in Computer Science (M.Sc. (Comp. Science)) Semester-III

### 218- Data Communication and Network

**Unit-1** : Introduction: Network structure and architectures and services OSI reference model. The Physical Layer: theoretical basis for data communication, transmission media. Analog Transmission, Digital Transmission, Transmission and Switching, ISDN. The Data Link Layer: Design issues, Errordetection and correction, Elementary data link protocols, sliding window protocol, protocols performance, protocols specification and verification. Examples of the Data link layer. Network Layer: Design issues, routing algorithms, Congestion control algorithms, Internet working, Examples of the network layer.

**Unit-2 :** The Transport Layer: Design issues, Connection Management. The session layer: Design issues and remote procedure call. The Presentation Layer: Design issues, data compression techniques,cryptography. The Application Layer: Design issues, file transfer, access and management, virtual terminals.

**Unit-3** : Network Security Fundamentals: Introduction, security Vulnerabilities and Threats, Classification of Security Services. Cryptography: Encryption principles, Conventional Encryption DES, IDEA, Algorithms, CBC, Location of Encryption Devices key Distribution.

**Unit-4** : Message Digests and Checksums, Message Authentication, Message Digests, Hash Functionsand SHA, CRCs. Public key Systems: RSA Diffie-Heliman, DSS, Key Management. Intruders: Intrusion Techniques, Intrusion Detection, Authentication, Password- Based Authentication, Address- Based Authentication, Certificates, Authentication Services, Email Security, Firewalls, Design Principles, Packet Filtering, Access Control, Trusted Systems, Monitoring and Management.

### 219- Software Engineering

**Unit-1** : Introduction to Software Engineering : The evolving role of software, Changing Nature of Software, Software myths. A Generic view of process : Software engineering- A layered technology, a process framework, The Capability Maturity Model Integration (CMMI), Process patterns, process assessment, personal and team process models. Process models : The waterfall model, Incremental process models, Evolutionary process models, The Unified process. Software Requirements : Functional and non-functional requirements, User requirements, System requirements, Interface specification, the software requirements document.

**Unit-2** : Requirements engineering process : Feasibility studies, Requirements elicitation and analysis, Requirements validation, Requirements management. System models : Context Models, Behavioral models, Data models, Object models, structured methods. Modeling with UML . Design Engineering
: Design process and Design quality, Design concepts, the design model. Creating an architectural design : Software architecture, Data design, Architectural styles and patterns, Architectural Design.

**Unit-3 :** Object-Oriented Design : Objects and object classes, An Object-Oriented design process, Design evolution. Performing User interface design : Golden rules, User interface analysis and design,interface analysis, interface design steps, Design evaluation. Testing Strategies : A strategic approachto software testing, test strategies for conventional software, Black-Box and White-Box testing, Validation testing, System testing, the art of Debugging. Product metrics : Software Quality, Metrics

for Analysis Model, Metrics for Design Model, Metrics for source code, Metrics for testing, Metrics for maintenance.

**Unit-4** : Metrics for Process and Products : Software Measurement, Metrics for software quality. Risk management : Reactive vs. Proactive Risk strategies, software risks, Risk identification, Risk projection, Risk refinement, RMMM, RMMM Plan. Quality Management : Quality concepts, Softwarequality assurance, Software Reviews, Formal technical reviews, Statistical Software quality Assurance,Software reliability, The ISO 9000 quality standards.

## 220- ASP.Net

**Unit-1** : ASP.NET programming model: Introduction, event driven programming over http, http protocol, structure of ASP.NET page, ASP.NET component model, ASP.NET Provider model, Anatomy of ASP.Net Page: Invoking page, Page class, Page Life cycle. ASP.NET Core Server controls: Generalities of Server Controls, Properties, events and methods of Control class, HTML controls: Generalities of HTML controls, HTML Containers, HTML input controls.

**Unit-2** : Web controls: Generalities of Web Control, core web control, misc web control, Validation controls: Generalities of validation controls, Gallery of controls, Programming with Web forms;Htm From Class, Multiple forms, cross page postings, Page errors, Page Personalization. Ritch Page Composition: Working with master page, working with themes, working with wizards,ADO.NET dataProviders, Connecting to data sources: connection strings, connection pooling, Executing commands:ADO Data Readers, Data Adapters, working with transactions, procedures etc. Data container objects:Data sets, Data tables, Data Relations, Data binding models: expressions and components.

**Unit-3** : Creating bindable grid of data: DataGrid Control, GridView control, Managing list of records: ListView control and Managing views of records: DetailView Control, FromView Control, Initialization of Application: HttpApplicationClass, Application module, methods and events of HttpApplication Class, The global.asax file, HttpContext Class, Server Object, HttpResponse Object, HttpRequest Object.

**Unit-4** : ASP.NET state management: Application state, Session State: working with session state, customizing session state, view state of page. ASP.NET caching: Caching Application data, the CacheClass, ASP.NET Security: Using Form authentication, membership and role management API, Security related controls, AJAX Enabled web services: Web services as application specific services, remote call via web services,

## 221-Mobile Computing

**Unit-1 :Mobile** Computing Mobile Communications: An Overview: Mobile Communication, Mobile Computing, Mobile Computing Architecture, Mobile Devices, Mobile System Networks, Data Dissemination, Mobility Management, Security Mobile Devices and Systems: Mobile Phones, Digital Music Players, Handheld Pocket Computers, Handheld Devices: Operating Systems, Smart Systems, Limitations of Mobile Devices, Automotive Systems GSM and Similar Architectures: GSM-Services and System, Architecture, Radio Interfaces, Protocols, Localization, Calling Handover, Security, New Data Services, General Packet Radio Service, High-speed Circuit Switched Data, DECT

**Unit-2 :Wireless** Medium Access Control and CDMA based Communication: Medium Access Control, Introduction to CDMA-based Systems, Spread Spectrum in CDMA Systems, Coding Methods In CDMA, IS-95 cdma One System, IMT- 20 0 0, i - m o d e , O F D M , Mobile IP Network Layer : IP and Mobile IP Network Layers, Packet Delivery and Handover Management, Location Management, Registration, Tunnelling and Encapsulation Route Optimization, Dynamic Host Configuration Protocol, Mobile Transport Layer, Conventional TCP/IP Transport, Layer Protocols, Indirect TCP, Snooping TCP, Mobile TCP, Other Methods of TCP-layer Transmission for Mobile Networks, TCP Over2.5G/3G MobileNetworks

**Unit-3 :Databases:** Database Hoarding Techniques, Data Caching, Client-Server Computing and Adaptation, Transactional Models, Query Processing, Data Recovery Process, Issues relating to Quality of Service, Data Dissemination and Broadcasting Systems: Communication Asymmetry, Classification of DataDelivery Mechanisms, Data Dissemination Broadcast Models, Selective Tuning and Indexing Techniques, Digital Audio Broadcasting, Digital Video Broadcasting, Data Synchronization in Mobile Computing Systems: Synchronization, Synchronization Software for Mobile Devices, Synchronization Protocols, SyncML Synchronization Language for Mobile Computing, Sync4J (Funambol), Synchronized Multimedia ,Markup Language (SMIL)

**Unit-4 :Mobile** Devices Server and Management: Mobile Agent, Application Server, Gateways, Portals, Service Discovery, Device Management, Mobile File Systems, Security, Mobile Adhoc and Sensor Networks: Introduction to Mobile Ad-hoc Network, MANET, Wireless Sensor Networks, Applications Wireless LAN, Mobile Internet Connectivity, and Personal Area Network: Wireless LAN (WiFi) Architecture and Protocol Layers, WAP 1.1 and WAP 2.0, Architectures, XHTML-MP (Extensible Hypertext Markup Language Mobile Profile), Bluetooth-enabled Devices Network, Layers in Bluetooth Protocol, Security in

**222- 3P1 based on theory paper- 3T1 and 3T2**
**223 - 3P2 based on theory paper 3T3**
**224 - Seminar 3**

# Master in Computer Science (M.Sc. (Comp. Science)) Semester-IV

## 225- Data Mining

**Unit-1** : Introduction to Data Mining: Why Mine Data? Commercial Viewpoint, Scientific Viewpoint Motivation, Definitions, Origins of Data Mining, Data Mining Tasks, Classification, Clustering, Association Rule Discovery, Sequential Pattern Discovery, Regression, Challenges of Data Mining, Data Mining-Data: What is Data? Attribute Values, Measurement of Length, Types and Properties of Attributes, Discrete and Continuous Attributes, Types of data sets, Data Quality, Data Preprocessing, Aggregation, Sampling, Dimensionality Reduction, Feature subset selection, Feature creation, Discretization and Binarization, Attribute Transformation, Density.

**Unit-2** : Data Mining: Exploring Data: Data Exploration Techniques, Summary Statistics, Frequency and Mode, Percentiles, Measures of Location: Mean and Median, Measures of Spread: Range and Variance, Visualization, Representation, Arrangement, Selection, Visualization Techniques: Histograms, , Box Plots, Scatter Plots, Contour Plots, Matrix Plots, Parallel Coordinates, Other Visualization Techniques, OLAP : OLAP Operations, Data Mining Classification: Bask Concepts, Decision Trees, and Model Evaluation: Classification: Definition, Classification Techniques, Tree Induction, Measures of Node Impurity, Practical Issues of Classification, ROC curve, Confidence Interval for Accuracy, Comparing Performance of Two Models, Comparing Performance of Two Algorithms.

**Unit-3** : Data Mining Classification: Alternative Techniques: Rule-Based Classifier, Rule Ordering Schemes, Building Classification Rules, Instance-Based Classifiers, Nearest Neighbor Classifiers, Bayes Classifier, Naive Bayes Classifier, Artificial Neural Networks (ANN), Support Vector Machines. Data Mining Association Analysis: Basic Concepts and Algorithms: Association Rule Mining, Frequent Itemset Generation, Association Rule Discovery : Hash tree, Factors Affecting Complexity, Maximal Frequent Horible Closed Itemset, Alternative Methods for Frequent Itemset Generation, FPgrowth Algorithm, Tree Projection, Rule Generation, Pattern Evaluation, Statistical Independence, Properties of A Good Measure, Support-based Pruning, Subjective Interestingness Measure.

**Unit-4 :** Data Mining Cluster Analysis: Basic Concepts and Algorithms: Applications of Cluster Analysis, Types of Clusters, Clustering Algorithms: 'K-means and its variants, Hierarchical clustering,Density based clustering. Graph-Based Clustering, Limitations of Current Merging Schemes, Characteristics of Spatial Data Sets, Shared Near Neighbor Approach, ROCK (RObust Clustering using linKs), Jarvis Patrick Clustering, SNN Clustering Algorithm, Data Mining Anomaly Detection: Anomaly jOutlier Detection, Importance, Anomaly Detection Schemes, Density-based: LOF approach

## 226- Artificial Intelligence & Expert System

**Unit-1** : AI problems, AI Techniques, Tic-tac-toe, Question Answering, Problem as a state space search, A water jug problem, production system, Control strategies, Heuristic Search, Problem Characteristics, Production system characteristics, Design of search programs AI Search techniques :-Depth-first, Breadth-first search, Generate-and-test, Hill climbing, Best-first search, Constraint satisfaction, Mean-ends-analysis, A* Algorithm, AO* algorithm.

**Unit-2 :** Knowledge Representation:- Representations and mappings, Knowledge Representations, Issues in Knowledge Representation, Predicate Logic:- Representing Instance and Isa Relationships, Computable Functions and predicates, Resolution, Natural Deduction, Logc programming, Forward versus Backward Reasoning, Matching, Control knowledge, Expert System.

**Unit-3 :** Games playing : Minimax search procedure , adding alpha-beta cutoffs, additional refinements, Planning :- Component of a planning system, Goal task planning, Nonlinear planning, Hierarchical Planning.

**Unit-4** : Understanding, Understanding as Constraint satisfaction, Natural Language Processing, Syntactic Processing, Unification grammars, Semantic Analysis, Introduction to pattern recognition, Parallel and Distributed AI, Psychological Modeling, Distributed Reasoning Systems,

## 227- Design and Analysis of Algorithm

**Unit-1** : Elementary Algorithmics: Introduction- Problems and Instances- The Efficiency of algorithms- Average and worst case Analysis. Asymptotic Notation: A notation for the order of – Other asymptotic notationConditional asymptotic notation- Asymptotic notation with several parameters- Operations on asymptotic notation. Analysis of Algorithms: Introduction- Analyzing control structures- Average case analysis- Amortized Analysis- Solving recurrences.

**Unit-2** : Greedy Algorithms: Making change- General Characteristics of Greedy algorithms- Minimum spanning trees and shortest paths- Knapsack Problems- Scheduling. Divide and Conquer: Introduction- Multiplying large numbers- The general template- binary searchsorting- Finding the median- Matrix multiplication- Introduction to cryptography.

**Unit-3** : Dynamic Programming: The Principle of Optimality- making change the knapsack problem- shortest paths- Chained matrix multiplication- approaches using recursion- Memory functions.

**Unit-4** : Back tracking & Brach Bound: Traversing trees- Depth first search of directed and ndirected graphBreadth first search- Back tracking- Branch and bound- The minimax principle, Introduction to NPCompleteness; Classes P and NP- Polynomial reductions- NP- Complete Problems NP- Hard problemsNon- Deterministic algorithms.

## 228- Parallel Computing

**Unit-1** : Introduction to Parallel Computing: Motivating Parallelism, Scope, Applications, Parallel Programming Platforms: Implicit Parallelism: Limitations of Memory System Performance, Dichotomy of Parallel Computing Platforms, Physical Organization of Parallel Platforms, Communication Costs in Parallel Machines, Routing Mechanisms for Interconnection Networks, Impact of Process-Processor Mapping and Mapping Techniques

**Unit-2 :** Principles of Parallel Algorithm Design: Preliminaries ,Decomposition Techniques, Characteristics of Tasks and Interactions, Mapping Techniques for Load Balancing, Methods for Containing Interaction Overheads, Parallel Algorithm Models, Basic Communication operations:One-to-All Broadcast and Allto-One Reduction, All-to-All Broadcast and Reduction, All-Reduce and Prefix-Sum Operations, Scatter and Gather, All-to-All Personalized Communication, Circular Shift , Improving the Speed of Some Communication Operations

**Unit-3** : Analytical Modeling of Parallel Programs: Performance Metrics for Parallel Systems, The Effect of Granularity on Performance, Scalability of Parallel Systems, Minimum Execution Time and Minimum pg. 27 Cost-Optimal Execution Time, Asymptotic Analysis of Parallel Programs, Other Scalability Metrics, Programming Using the Message Passing Paradigm: Principles of Message-Passing Programming, The Building Blocks: Send and Receive Operations , MPI: the Message Passing Interface, Topologies and Embedding, Overlapping Communication with Computation, Collective Communication and Computation Operations, Groups and Communicators,

**Unit-4** : Programming Shared Address Space Platforms: Thread Basics, Why Threads? The POSIX Thread API, Thread Basics: Creation and Termination, Synchronization Primitives in Pthreads, Controlling Thread and Synchronization Attributes, Thread Cancellation, Composite Synchronization Constructs, Tips for Designing Asynchronous Programs, OpenMP: a Standard for Directive Based Parallel Programming, Dense Matrix Algorithms: Matrix- Vector Multiplication, Matrix-Matrix Multiplication, Solving a System of Linear Equations Sorting: Issues in Sorting on Parallel Computers, Sorting Networks, Bubble Sort and its Variants, Quicksort, Bucket and Sample Sort, Other Sorting Algorithms, Graph Algorithms: Minimum spanning tree Prims Algorithm, Single-Source Shortest Paths: Dijkstra's Algorithm Search Algorithms for Discrete Optimization Problems: Sequential Search Algorithms, Search Overhead Factor, Parallel Depth-First Search, Parallel Best-First Search, Speedup Anomalies in Parallel Search Algorithms, Dynamic Programming: Overview of Dynamic Programming, Serial Monadic DP Formulations, Monadic DP Formulations, The Longest-Common-Subsequence Problem, Serial Polyadic DP Formulations, Floyd's All-Pairs Shortest-Paths Algorithm, Nonserial Polyadic DP Formulations, The Optimal Matrix-Parenthesization Problem, Fast Fourier Transform: The Serial Algorithm, The BinaryExchange Algorithm, The Transpose Algorithm.

**229-  based on theory paper 4T1, 4T2 and 4T3.**
**230– Project**
**231 - Seminar**