Govt. KRG PG Autonomous College, Gwalior, MP
BCA – Session 2021-2022

PAPER CODE BCA - 301
Discrete Mathematics

Max. Marks: External 80 + Internal 20

UNIT-I Introduction and Preliminaries: Logical connectives, Truth tables, Tautologies and Contradiction, Logical equivalence, Algebra of propositions.

Set Theory: Set, Singleton set, Finite and Infinite sets, Subsets, Proper subsets, Equality of sets, Union, Intersection and Difference of sets, Universal set, De Morgan laws, Symmetric difference of sets, Generalized De Morgan laws, Cartesian product of sets.

UNIT-II Relations: Relation between two sets, Binary relation on a set, Types of binary relations, Equivalence relation, Equivalence class, Partition of a set, Fundamental theorem of equivalence relation, Composition of relations.

Functions: Function or mapping, One-one, Many-one, into and onto mappings, Identity mapping, Constant mapping, Equality of mappings, Inverse of a mapping, Composition of mappings.

UNIT-III Boolean algebra: Definition and properties of Boolean algebra, a brief introduction to the application of Boolean algebra to switching theory, conversion of complicated switching circuits to simple one, Disjunctive and Conjunctive normal forms.

Graph Theory: Introduction to graph theory, Paths and Circuits, Trees, Spanning trees, Cut-sets, Fundamental circuits and cut-sets.

UNIT-IV Matrices: Introduction, Expression of complex numbers in the form of a matrix, De Moivre's theorem, Elementary transformations, Elementary matrices, Equivalent matrices, Properties of equivalent matrices, Sub-matrix of a matrix, Rank and Nullity of a matrix, Row equivalence and canonical form, Normal form of a matrix.

UNIT-V Solution of Homogeneous and Non-homogeneous system of linear equations, Characteristic roots and Characteristic vectors of a matrix, Caley-Hamilton theorem, to find the inverse of a non-singular matrix using Caley-Hamilton theorem.

Recommended Books:

1. Discrete Mathematical Structures with Applications to Computer Science by Tremblay & Manohar.
2. Discrete Mathematics by Iyengar, Chandrasekharan, Venkatesh & Arunachalam.
3. Discrete Mathematical Structures by Kolman, Busby & Ross.
4. Graph Theory with Applications to Engineering and Computer Science by Narsingh Deo.
5. Discrete Mathematical structure by Kolman.
6. Discrete Mathematics by J.P. Sharma
7. Graph Theory by Harvey.

PAPER CODE BCA - 302
Programming in Visual Basic
Max. Marks: External 80 + Internal 20

UNIT 1-A profile of VB - Menus, Tool bar Buttons , Tool box, Form , Project, controls, Properties, Program window.
Programming Essentials- General Procedures, Sub Procedures and function-designning,. Calling & passing controls as arguments , Constant & variable : Decleration, Scope and types.

UNIT 2-DESIGNING A PROJECT :- START UP FORM , PROPERTIES AND PROGRAM DESIGN , MANAGING MULTIPLE FORMS.
Flow of control - decesions - if statement , Else if clause ,Select case structure, Nested decisions. Loops :- Do loops , For loops ,

UNIT 3-Arrays ,Declarings arrays ,Multidimentional & dynamic arrays , User defined types :- Recorded structures, With statement arrary of records .
Date file :- Random Access Files - Opening & closing of file , Put # , Get# ,Seek# statements.
TEXT FILES - OPENING & CLOSING FILE, WRITE# , PRINT# , INPUT # , LINE INPUT # STATEMENTS.

UNIT 4-INPUT & OUT PUT PROCEDURES - DEFINING A MENU , CONTROL ARRAYS , INPUT TECHNICHES - VALIDATING & FORMATTING THE INPUT , MOVING THE FOCUS , MENU CHOICES OUT PUT TECHNIQUES - CALCULATION & DISPLAY , DRAWING CHART,.

UNIT 5-Visual basic controls:- Intrinmic Controls, Custom control, Common dialog control , Printer object. Object, Classes and Collections :- Developing classes & collection MDI form , OLE controls . Data base connections.Data manager programme , Data control ,Bound controls.

REFERENCE:

1. Foundation of Visual Basic - Douglus Hergert.

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PAPER CODE BCA - 303
INTRODUCTION TO SYSTEM ANALYSIS AND DESIGN

Max. Marks: External 80 + Internal 20

UNIT 1-SYSTEM: DEFINITION AND CONCEPT; REAL TIME AND DISTRIBUTED SYSTEMS; DATA INFORMATION AND RELATED ATTRIBUTES; SYSTEM ANALYSIS AND ANALYST.

UNIT 2-System development life cycle: study, analysis, design, development and implementation; System planning; data fact finding techniques.

UNIT 3-SYSTEM DESIGN AND MODELING: LOGICAL AND PHYSICAL DESIGN REPRESENTATION, DATA FLOW DIAGRAM, ERD, STRUCTURE CHARTS.

UNIT 4- forms design :classification, user interface; standards; control and validation checks; user interface guidelines modular and structured design.

UNIT 5-SYSTEM IMPLEMENTATION & MAINTENANCE; PROJECT MANAGEMENT TECHNIQUES; USE OF AN AVAILABLE TOOL TO IMPLEMENT A CASE STUDY.

Reference:

1. James, A.S.: Analysis and Design of Information systems, McGraw Hill, 1986.
2. Ludeberg, M., Golkuhl, G. & Hilson, A.: Information Systems Development, A sysematic Approach, Prentice Hall International, 1981..
3. Leason, M.: Systems Analysis and Design, Science Research Associates,

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PAPER CODE BCA - 304
Communication Techniques
Max. Marks: External 80 + Internal 20

English Language:

UNIT 1-Review of English Grammar; Written and Spoken Language; Common Errors in language; Punctuation (purpose, role, importance and use); OED; Language Skills(Listening, Speaking, Reading, Writing).

UNIT 2- Meaning what you mean; Listening: Effective and efficient listening in various situations (discussions, lectures, news, seminars, speech, telephone calls etc.); Reading: Purpose; Comprehension; Tactics and strategies for good reading; Writing: Guidelines for good writing; various writing styles (General and Technical writing styles).

COMMUNICATION SKILLS:

UNIT 3-COMMUNICATION (PURPOSE, ROLE, IMPORTANCE, ELEMENTS); EFFECTIVE AND EFFICIENT COMMUNICATION; ROLE OF CONTENT, CONTEXT AND LANGUAGE; SPOKEN AND WRITTEN COMMUNICATION; PRESENTATION AND DELIVERY; ROLE OF SPEAKER AND AUDIENCE; STYLE AND BODY LANGUAGE.

UNIT 4-Planning, organization, presentation, participation, conduction and feedback of discussions, meetings, seminars etc; Effective and efficient presentation and discussion skills; Discussion and Presentation skills of conferences, meetings, seminars etc.

UNIT 5-General and Technical documents(correspondence (applications, letters, resumes, CV), drafts, proposals, précis, reports, summary, synopsis,),Use of Audio-Visual Aids: OHP, Slides, Charts, Computers.

REFERENCE :

1. WREN & MARTIN - GRAMMAR
2. BOOKS PRESCRIBED BY M.P. UCHAHA SHIKSHA ANUDAN AYOG ARE THE TEXT BOOKS FOR THIS SYLLABUS.

PAPER CODE BCA - 305
Computer Graphics & Multimedia
Max. Marks: External 80 + Internal 20

UNIT 1-BASICS OF GRAPHICS SYSTEMS APPLICATIONS, DISPLAY DEVICES : VIDEO DISPLAYS, RASTER-SCAN DISPLAYS, RANDOM SCAN DISPLAYS, DVST, FLAT-PANEL DISPLAYS. INPUT DEVICES : KEYBOARDS, MOUSE, TRACKBALL AND SPACE BALL, JOYSTICKS, IGITIZERS, IMAGE SCANNER, TOUCH PANEL, LIGHT PENS, VOICE SYSTEMS ETC.

UNIT -2-Line drawing algorithms: DDA Algorithm, Bresenham's line Algorithm.

Bresenham's Circle drawing algorithm, Mid-Point Circle Algorithm, Scan-line Polygon Fill Algorithm, Inside-Outside test, Boundary Fill algorithm, Flood-Fill algorithm. Pixel, Pixel addressing, Antialiasing.

UNIT 3-CLIPPING : COHEN-SUTHERLAND LINE CLIPPING ALGORITHM, LINE CLIPPING USING NON RECTANGULAR CLIP WINDOWS, POLYGON CLIPPING,TEXT CLIPPING.

UNIT 4- Two-dimensional geometric transformation : Translation, Rotation, Scaling, Reflection, Shear, Matrix representation and Homogeneous coordinates. Composite transformation: Translations, Rotations,Scalings.General Pivot-Point Rotation and Scaling.

UNIT 5 -INTRODUCTION TO MULTIMEDIA: REVIEW OF MULTIMEDIA, MULTIMEDIA APPLICATIONS, MULTIMEDIA

SYSTEMS ARCHITECTURE, MULTIMEDIA HRADWARE, MULTIMEDIA SOFTWARE, REPRESENTATION AND OPERATIONS

ON VARIOUS MULTIMEDIA DATA TYPES: TEXT, IMAGES, GRAPHICS, VIDEO AND AUDIO, INTRODUCTION TO

MULTIMEDIA AUTHORING.

UNIT 5-INTRODUCTION TO MULTIMEDIA: REVIEW OF MULTIMEDIA, MULTIMEDIA APPLICATIONS, MULTIMEDIA

SYSTEMS ARCHITECTURE, MULTIMEDIA HRADWARE, MULTIMEDIA SOFTWARE, REPRESENTATION AND OPERATIONS

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