THIRD YEAR BCA-5th Semester
OBJECT ORIENTED ANALYSIS AND DESIGN
Paper-5.3 (Theory)

Time: 3 Hours

Full Marks: 80+20 = 100

(All units carry equal marks)

Unit-I

Object Oriented Modeling, Characteristics Object Oriented Modeling: Class and Objects, Links and Association, Generalization and Inheritance, An Object Model, Benefits of OO Modeling, Introduction to OOAD tools, Object Oriented Analysis: Object Oriented Analysis, Problem Statement: an Example, Differences between Structured Analysis and Object Oriented Analysis.
Analysis Techniques: Object Modeling, Dynamic Modeling, Functional Modeling, Adding Operations, Analysis Iteration.

Unit-II

Using UML, UML: Introduction, Object Model Notations, Basic Concepts, Structural Diagrams: Class, Object, Composite, Package, Component, Deployment, Behavioral Diagrams: Use Case, Communication, Sequence, Interaction Overview, Activity, State, Modeling with Objects.

Unit-III

System Design: An Object Oriented Approach, Breaking into Subsystems, Concurrency Identification, Management of data store, controlling events between Objects, Handling Boundary Conditions, Object Design for Processing, Object Design Steps, Designing a Solution, Choosing Algorithms, Choosing Data Structures, Defining Classes and delegation of Responsibilities to Methods.

Unit-IV

Advance Object Design, Control and its Implementation: Control as a State within Program, Control as State Machine Engine, Control as Concurrent Task, Inheritance Adjustment, Association: Design, Object Representation, Design Optimization, Design Documentation, Object Modeling, Advance Modeling Concepts: Aggregation, Abstract Class, Multiple Inheritance, Generalization as an Extension, Generalization as a Restriction, Metadata Constraints, An Object Model.

NB:-INTERNAL ASSESSMENT TEST-20 MARKS, DURATION:-1HR

Text Book:

G. Booch, Object Oriented Analysis and Design.

THIRD YEAR BCA-5th Semester
INTERNET AND WEB TECHNOLOGY
Paper-5.4 (Theory)

Time: 3 Hours   Full Marks: 80+20 = 100

(All units carry equal marks)

Unit-I:-
Evolution of Internet, Internet architecture, Intranet, Extranet, Types of internet, Local area network, Metropolitian area network, Wide area network, Packet switching, circuit switching

UNIT-II:- TCP/IP Model, IPV4, IPV6, Domain name system & Uniform resource locator, File transfer Protocol ,TELNET

UNIT-III :-Static and Dynamic HTML, Basic HTML tags & usages, Email, world wide web, Standards:-ITU, IEEE ,IETF

UNIT-IV:-Virus, Types of viruses, Spam, Firewalls, Security issues including symmetric and asymmetric encryption

NB:-INTERNAL ASSESSMENT TEST-20 MARKS, DURATION:-1HR

Text Book:-FOROUZAN B. A.,Data communication and Networking", Tata Mcgraw Hill

THIRD YEAR BCA-5th Semester
INTRODUCTION TO SOFT COMPUTING
Paper-5.5 (Theory)

Time: 3 Hours   **Full Marks: 80+20 = 100**

(All units carry equal marks)

Unit-I INTRODUCTION

Introduction to soft computing, characteristics, Artificial Neural Network and its design, Applications of ANN, Basic learning schemes and activation functions.

Unit-II ARTIFICIAL INTELLIGENCE

Introduction, Knowledge Representation – Reasoning, Issues and Acquisition: Prepositional and Predicate Calculus Rule Based knowledge Representation Symbolic Reasoning Under Uncertainty Basic knowledge Representation Issues Knowledge acquisition – Heuristic Search: Techniques for Heuristic search Heuristic Classification - State Space Search: Strategies Implementation of Graph Search Search based on Recursion Patent-directed Search Production System and Learning.

Unit-III OPTIMIZATION

Derivative-based Optimization – Descent Methods – The Method of Steepest Descent – Classical Newton's Method – Step Size Determination – Derivative-free Optimization – Genetic Algorithms – Simulated Annealing –Random Search – Downhill Simplex Search.

Unit-IV FUZZY SET THEORY

Introduction to Neuro – Fuzzy and Soft Computing – Fuzzy Sets – Basic Definition and Terminology – Set-theoretic Operations – Member Function Formulation and Parameterization – Fuzzy Rules and Fuzzy Reasoning – Extension Principle and Fuzzy Relations – Fuzzy If-Then Rules – Fuzzy Reasoning – Fuzzy Inference Systems – Mamdani Fuzzy Models – Sugeno Fuzzy Models – Tsukamoto Fuzzy Models – Input Space Partitioning and Fuzzy Modeling.

Unit-V APPLICATIONS OF COMPUTATIONAL INTELLIGENCE

Printed Character Recognition – Inverse Kinematics Problems – Automobile Fuel Efficiency Prediction – Soft Computing for Color Recipe Prediction.

NB:-INTERNAL ASSESSMENT TEST-20 MARKS, DURATION:-1HR
TEXT BOOKS:
1. J.S.R.Jang, C.T.Sun and E.Mizutani, "Neuro-Fuzzy and Soft Computing", PHI, 2004, Pearson Education 2004.
2. N.P.Padhy, "Artificial Intelligence and Intelligent Systems", Oxford University Press, 2006.
REFERENCES:
1. Elaine Rich & Kevin Knight, Artificial Intelligence, Second Edition, Tata Mcgraw Hill Publishing Comp., 2006, New Delhi.
2. Timothy J.Ross, "Fuzzy Logic with Engineering Applications", McGraw-Hill, 1997.
3. Davis E.Goldberg, "Genetic Algorithms: Search, Optimization and Machine Learning", Addison Wesley, N.Y., 1989.

4. S. Rajasekaran and G.A.V.Pai, "Neural Networks, Fuzzy Logic and Genetic Algorithms", PHI, 200UNIT III
5. R.Eberhart, P.Simpson and R.Dobbins, "Computational Intelligence - PC Tools", AP Professional, Boston, 1996.

THIRD YEAR BCA-5th Semester
INTERNET AND WEB TECHNOLOGY LAB
Paper-5.6 (Practical)

Time: 6 Hours

Full Marks: 100

HTML:HTML different tags use,
　　　Structure of an HTML program
　　Document head
　　Document body
　　Titles and footers
　　Text formatting(paragraph breaks, Line breaks)
　　Text Styles(Bold, Italic, underline)
　　Other Text effects
　　Centering(Text, images)
　　Spacing(Indenting Text)
　LISTS
　　　TYPES OF LISTS
　　Unordered list(Bullets)
　　Ordered lists(Numbering)
　　Defination lists
　TABLES
　　　THE CAPTION TAG
　　　USING WIDTH AND BORDER ATTRIBUTE
　　　USING THE CELLPADING ATTRIBUTE
　　　USING THE CELLSPACING ATTRIBUTE
　　　USING THE BACKGROUND COLOR PROPERTY
　　　USING THE COLOR SPAN AND ROWSPAN ATTRIBUTES
　FRAMES
　　THE<FRAMESTE> TAG
　　THE<FRAME> TAG

DHTML

Marks Distribution
- Experiment(2X15):- 　60
- Record:- 　20
- Viva:- 　20

THIRD YEAR BCA-6th Semester
ARTIFICIAL INTELLIGENCE
Paper-6.1 (Theory)

Time: 3 Hours   Full Marks: 80+20 = 100

(All units carry equal marks)

Unit-I
Introduction, Concepts & definitions of AI, Brief history of AI, AI and related fields, Problems, Techniques, Characteristics and underlying assumption of AI, Turing test .

Unit-II
State Space Representation & Search Techniques, Uninformed searches, informed searches: generate and test, Hill-climbing, best-first search, A* algorithm, Problem reduction, Constraint satisfaction.

Unit-III
Game Playing & Propositional & Predicate Logic, The Min-Max Search Procedure, Alpha-Beta Cutoffs, Syntax and semantics for prepositional logic, Syntax & semantics of First Order Predicate Logic (FOPL), Properties of well-formed formula (wff).

Unit-IV
Fuzzy Logic, Fuzzy Sets, Fuzzy Operators & Arithmetic, Membership Functions, Fuzzy Relations.

Unit-V
In neural and belief Networks, How the Brain works, Natural Networks,& applications, Perceptrons, Multilayered Feed Networks, Application back Propagation algorithm.

NB:-INTERNAL ASSESSMENT TEST-20 MARKS, DURATION:-1HR

Books:
1. Artificial intelligence:
2. Reichi Night: Artificial intelligence
3. Russel:" Artificial intelligence

THIRD YEAR BCA-6th Semester
MULTIMEDIA AND APPLICATION
Paper-6.2 (Theory)

Time: 3 Hours   Full Marks: 80+20 = 100

(All units carry equal marks)

Unit-I

Introduction, Multimedia Literature, Media and data streams, (The perception medium, The representation medium, Presentation medium, Storage medium, Informal Exchange, Values and representation spaces, Representation dimension). Main properties of multimedia system, Multimedia, Traditional data streams characteristics, Data stream characteristics for continuous media, Sound / Audio, basic sound concept, Music, speech, image graphics, Computer image processing.

Unit-II

Video & Animation (Television, Computer based Animation) Data compression (storage space, coding requirements, source, entropy and hybrid coding, JPEG, H, 216, MPEG, DVI.

Unit-III

Optical Storage Media, Computer technology (communication architecture, multimedia workstation). Multimedia Operating system, Networking system.

Unit-IV

Multimedia Communication System (Application subsystem, Transport subsystem, Quality of service and resource management). Database systems, Data analysis, Data structure.

Unit-V

Documents, Hypertext and MHEG (Documents, Hypermedia, document Architecture SGMI, Document architecture ODA, MHEG). User and Interface, Synchronization (Notion of synchronization, Presentation requirements), Multimedia applications (Media Preparation, Media composition, Media integration, Media communication).

NB:-INTERNAL ASSESSMENT TEST-20 MARKS, DURATION:-1HR

Books Recommended:

1. Steinmetz R & Nahrstedt, K. – Multimedia: Computing, Communications & Applications, Pearson Education.
Unit-I (Chapters 1,2,3,4) Unit-II (Chapters 5,6), Unit-III (Chapters 7,8,9,10), Unit-IV (Chapters 11,12), Unit-V (Chapters 13,14,15,17).

Reference:

1. Vaughan Tay – Multimedia: Making it work 5th ed., Tata Mc Graw Hill 2. Halsall F. – Multimedia Communications, Pearson Education.

THIRD YEAR BCA-6th Semester
MAJOR PROJECT
Paper-6.3 (PROJECT)

Time: 3 Hours

Full Marks: 300

(All units carry equal marks)

THIRD YEAR BCA-6th Semester
SEMINAR PRESENTATION AND VIVA-VOCE
Paper-6.4

Time: 3 Hours

Full Marks: 100

(All units carry equal marks)

Courses of Studies | B.C.A

THIRD YEAR BCA-5th Semester
COMPUTER GRAPHICS
Paper-54 (Theory)

Time: 3 Hours   Full Marks: 80+20=100

(All units carry equal marks)

Unit-I
Survey of computer graphics applications, overview of graphic system – video display devices, raster scan systems, graphics monitors and workstations, input devices, hard copy devices, graphics software, Output primitives- Line, circle and ellipse, generating algorithms, pixel addressing.

Unit-II
Attributes of output primitives – Line and curve attributes, colors and gray scale levels and area-fill attributes, character attribute, bundled attribute, and anti-aliasing.

Two dimensional geometric transformation- basic transformation – translation, rotation, scaling and matrix representation. Composite transformation- translation, rotating, scaling, Transformation between coordinate system, affine transformation, Two dimensional viewing – viewing coordinates, point, line, polygon, curve and text clipping.

Unit-III
Structure and hierarchical modeling: Three dimensional display methods, three dimensional object representations- polygon surface, quadric surface, straight line representation, Bezier curves and surfaces, B-Spline curves and surfaces, displaying Spline curves, sweep representations, constructive solid geometry methods. BSP trees, fractal geometry method.

Unit-IV
Three dimensional geometric and modeling transformation- translation, rotating, scaling, reflection, shares, coordinates transformation. Three dimensional viewing- viewing coordinates, projection, projection transformation and clipping.

NB:-INTERNAL ASSESSMENT TEST-20 MARKS, DURATION:-1HR

Book Recommended:

1. D. Hearn & M.P. Baker – Computer Graphics, PHI
2. R.S. Wright Junior, M. Sweet – Open GL Super Bible, Tech. Media

Reference:

1. J.D. Folay, A. Vandan, Feinersteven, Hugh John – Computer Graphic: Principles & Practice (Add. Wesely PUB, 1999

THIRD YEAR BCA-5th Semester
THEORY OF COMPUTATION
Paper-5.2 (Theory)

Time: 3 Hours

Full Marks: 80+20 = 100

(All units carry equal marks)

Unit-I

Introduction: Automata, Computability and Complexity, Finite Automata, Formal Definition of Finite Automata and Computation. Designing Finite Automata, Regular Operations, Nondeterminism, Non-deterministic Finite Automata, Equivalence of NFAS and DFAS.

Unit-II

Regular Expressions: Formal Definition of Regular Expression, Equivalence with Finite Automata, Generalized Non-deterministic Finite Automata, Non-Regular Languages, Pumping Lemma for Regular Language.

Unit-III

Context Free Languages and Pushdown Automata: Context Free Grammars(CFG), Formal Definition of Context Free Grammar, Examples, Ambiguity, Chomsky Normal Form, Pushdown Automata(PDA), Formal Definition of Pushdown Automaton, Equivalence of PDA with Context Free Grammars, Pumping Lemma for Context Free Languages.

Unit-IV

The Church - Turing Thesis: Turing Machines, Formal Definition of a Turing Machine, Examples of Turing Machine, Variants of Turing Machines : Multitape Turing Machines, NonDeterministic Turing Machines, Enumerators,Eequivalence with other models.

NB:-INTERNAL ASSESSMENT TEST-20 MARKS, DURATION:-1HR

Books:

1. Anil Maheshwari, Michiel Smid, Introduction to Theory of Computation.

2. Michael Sipser, Introduction to the Theory of Computation.

3. J.A Anderson Automata Theory with Modern Applications.