BCA - III

Subject Code	Subject Paper	Theory Marks		Internal Marks		Teaching Load per Week		
						L	T	P
		Max. (A)	Min. (B)	Max. (C)	Min. (D)			
***BCA301**	Part I- Calculus & Geometry	50	60	-	-	2	-	-
	Part II-Differential Equation & Fourier Series	50		-	-	2	-	-
	Part III- Computer System Architect	50		-	-	2	-	-
BCA302	Java	100	40	50	30	4	2	-
BCA303	Operating System	100	40	50	30	4	2	-
BCA304	Software Engineering	100	40	50	30	4	2	-
BCA305	**1**MULTIMEDIA TOOLS AND APPLICATIONS B. Practical based on course 305A	50 50	20 20	- -	- -	2	2 -	- 2x2
BCA306	A. Financial Management & Accountancy B. Foundation Course	50 50	40	- -	- -	2 2	- -	- -
BCA307	Practical Based on Course-302	100	50	-	-	-	-	3x2
BCA308	Project	100	50	-	-	-	-	1x2
TOTAL		850	360	150	90			
GRAND TOTAL	(PAPER + INTERNAL)	**(A+C) 1000**		**(B+D) 450**				

* Minimum passing marks in subject BCA301 is 40% of total marks 150(i.e. Total of Part I + Part II + Part III marks of BCA301)

BCA301
CALCULUS & GEOMETRY

Max. Marks : 50

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific calculator.

Calculus

Unit –I

The Reimann Integral, Existence of the Riemann Integral, Properties of Reimann Integrals, Fundamental Theorem of Integral Calculus.

Unit-II

Maxima and minima of functions of two and three variables. Langrange's method of undetermined multipliers.

Unit-III

Improper integrals, Meaning of integrals of type $\int_a^\infty f(x)\,dx$, $\int_a^b f(x)\,dx$ where f(x) is not defined at a and/or b. Tests of convergence for improper integrals.

Geometry

Unit- IV

Equation to cone with given base, Generators of Cone, condition for three mutually perpendicular generators, Right Circular Cone, Equation of a cylinder.

Unit-V

Polar Coordinates, Polar equation to straight line, Circle. Polar equation of a Conic.

REFERENCE:

1.Calculus of two and more variables: G.S. Pandey & V.P. Saxena (Wiley Eastern)
2.Higher calculus : P.L.Sharma
3.Vector Calculus & Geometry : B.R.Thakur.

BCA301
DIFFERENTIAL EQUATIONS & FOURIER SERIES

Max Marks : 50

Note : The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific calculator.

Unit –I

Concept of Differential equation. Recall of first order and first degree differential equations. Equation of first order but of higher degree. Homogeneous and exact differential equations.

Unit-II

Geometric representation, Family of curves and orthogonal trajectories. Linear differential equation with constant coefficients. Operational rules of D. Homogeneous linear equations.

Unit-III

Partial differential equations of first order, Standard forms, Linear partial differential equations of higher order with constant coefficients.

Unit- IV

Periodic Function, Fourier Sine and Cosine Series, Even and Odd Functions, Full Range and Half Range Fourier Series

Unit-V

Convergence of Fourier Series, Gibbs Phenomenon, Operations on Fourier Series, Applications of Fourier Series to Differential Equation

REFERENCE:

1.Introductory course in differential equations : D. A. Murray

2.Differential equations(Awkl Sameekaran) : B.P. Parashar & L.P. Rajpal
3.Differential equations and Fourier Series : H.K.Pathak

BCA 301
Computer System Architecture

Max Marks : 50
Note : The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific Calculator.

UNIT I
Data Representation – Data Types, Number System, Fixed Point Representation – 1's, 2's complements, Binary Fixed point representation, Arithmetic operation on Binary operation, Overflow & Underflow, Codes, ASCII, EBCDIC codes, Grey codes, Excess-3, BCD codes, Error detection & correcting codes.

UNIT II
Digital Logic Circuits – Logic Gates AND, OR, NOT, Gates & their truth tables, NOR, NAND & XOR Gates, Boolean algebra, Basic Boolean Law, Doorman's theorem, Map Simplification, Minimizing technique, K Map, Sum of product, Product of sums, Combinational & sequential Circuits Half adder & Full adder, Full Subtractor, Flip Flop – RS, D, JK & T Flip Flop, Shift register, RAM & ROM.

UNIT III
CPU organization, ALU & Control circuit, Idea about arithmetic circuits, Program control, Instruction sequencing, Introduction to Microprocessor, Microprocessor architecture, System buses, Registers, Program counter,, Block diagram of a Macro computer system, Microprocessor control signals, Interfacing Devices ,Introduction to Motherboard ,SMPS

UNIT IV
Input output organization, I/O Interface, Properties of simple I/O devices and their Controller, Isolated versus Memory mapped I/O, Modes of Data transfer, Synchronous & Asynchronous Data Transfer, Handshaking, Asynchronous serial transfer, I/O processor

UNIT V
Auxiliary memory - Magnetic drum, Disk & Tape, Semi conductor memories, Memory Hierarchy, Associative memory, Virtual memory, address space & memory space, Address mapping, Page table, Page replacement, cache memory, Hit ratio, Mapping Techniques, Writing into cache.

REFERENCE:
1. Computer System architecture - M. Moris Mano

BCA - 302
Programming In JAVA

Max marks-100 Min marks – 40
Note : The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific calculator.

UNIT - I
Introduction : Genesis of java, importance to the Internet, overview of features.
OOP : OOP features, data types, control structures, arrays, methods and classes, nested & inner classes, string and String Buffer class, Wrapper Class, vectors,

UNIT-II

Inheritance : Basics type,, method Override, using abstract and final classes, using super.

Packages and Interfaces : Defined CLASSPATH, importing packages, implementing interface.

UNIT - III

Exception Handling : Fundamental: exception types, using try and catch, throwing exceptions, defined exceptions.

Multithreaded Programming : Java spread model, creating threads, and thread priorities, synchronization. Suspending resuming and stopping threads.

UNIT –IV

Input/Output: Basic Streams, Byte and Character Stream, predefined streams, reading and writing from console and files. Using standard Java Packages (lang,util,io)

Networking : Nasecs. TCP/IP client & server sockets, URL connection.

JDBC: Setting the JDBC connectivity with backend database.

UNIT-V

Applets : Fundamentals, life cycle, overriding update, HTML APPLET tag, passing parameters. Developing single applets.

Introduction to AWT : Window fundamentals, creating windowed, programs waking with graphics, using AWT controls, menus. Delegation event model, handling mouse and keyboard events.

BOOKS RECOMMENDED:

1. java complete reference - by Patrick naughten & Mesut Scpddt. [TMH]
2. Java Primer - by E.Balaguruswami
3. Java Programming - Khalid Mughal

BCA - 303
OPERATING SYSTEM

Max marks-100 Min marks – 40

Note : The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific calculator.

UNIT-I

Introduction

What is operating system, basic concept, terminology, batch processing, spooling, multiprogramming, time sharing, real time systems, protection, multiprocessor system, operating system as resource manager, process view point, memory management, process management, device management and information management, other views of operating system, historical, functional job control language and supervisor service control.

UNIT-II

Processor Management (CPU Scheduling)

Reviewing of multiprogramming concept, scheduling concept, basic concept, CPU I/O burst cycle process state, PCB (Programme Control Block) scheduling queries, schedulars, scheduling algorithms - performance criteria, first-come - first served shortest job - first priority, preemptive algorithm, round robin, multilevel queues and multilevel feedback queues, algorithm evolution, multiprocessor scheduling , separate system, coordinated job scheduling, master / slave scheduling.

UNIT-III

Memory Management

Preliminaries of memory management, memory handling in M/C, relocation, swapping and swap time calculation, multiple partitions, partitioned allocation MFT, fragmentation, MVT, compaction, paging, job scheduling implementation of page tables, shared page, virtual memory-overlays, concepts of virtual memory demand page, memory management and performance, page replacement and page replacement algorithms. Allocation algorithms. Storage hierarchy disk and drum scheduling - physical characteristics fcfs scheduling SCAN, short of seek time first disk scheduling algorithms sector queuing.

UNIT - IV

Information Management (File System)

File concept, file type, typed based system, disk based system, general model of file system, file directory maintenance, symbolic file system, basic file system, physical file system, file support device directory, access methods free space management contiguous, linked allocation and indexed allocation performances.

UNIT V

Dead Locks

The Dead Lock problem - Dead Lock definition, Dead Lock detection, detection algorithm usage, Dead Lock characterization, resource allocation graph, Dead Lock prevention, mutual exclusion, hold and wait, no preemption and circular wait, dead lock avoidance-bankers algorithm. Recovery from Dead Lock process termination, resource preemption, combined approach to Dead Lock handling.

BOOKS RECOMMENDED :

1. Principles of Operating System - Peterson.
2. Operating System - Mandinick & Donovan.

BCA (Third Year) : BCA - 304
Software Engineering

Max marks-100 Min marks – 40

NOTE :- The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice.

Unit 1 : Introduction to Software Engineering

e. Definition
f. Need and Software problem
g. Software Crises
h. Software Engineering Problem
    1. Fundamental Problem
    2. Important Quality of Software Product
i. Software Engineering Approach
    1. Phase Development Process
    2. Life Cycle of Software
j. Principles Of Software Engineering
k. Software Development Process Model
    1. Waterfall model
    2. Spiral Model
    3. Prototype Model
    4. Iterative Model

Unit 2 : Project Management

a. The Phase Management Process
b. Software Metrics
    1. Size Oriented Metrics
    2. Function Oriented Metrics

Unit 3 : Software Requirement and Specification

a. Introduction and Need of SRS
b. Structured Analysis
    1. Data Flow Diagram
    2. Context Diagram
    3. Data Dictionary

Unit 4 : Software Design & Coding

f. Principle of Software Design
    1. Partitioning
    2. Abstraction
    3. Top Down and Bottom up Strategies

g. Concept of Module
    1. Coupling
    2. Cohesion
h. Structured Chart
i. Coding – a. Rules of Good programming Style
    b. Code Verification

Unit 5 : Software Testing and Maintenance

a. Definition
b. Testing Fundamentals
   Error, Fault, Failure
c. Test Oracles
d. Types of Testing
    1. Black Box Testing
    2. White Box Testing
e. Level of testing- Unit, Integration, System, Acceptance
f. Introduction of Maintenance

Books

1. Software Engineering by Roger Pressmen

BCA - 305
MULTIMEDIA TOOLS AND APPLICATIONS

Max marks-50 Min marks – 20

Note : The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific calculator.

UNIT–I

Multimedia: Needs and areas of use, Development platforms for multimedia – DOS, Windows, Linux. Identifying Multimedia elements – Text, Images, Sound, Animation and Video, Making simple multimedia with PowerPoint.

Text – Concepts of plain & formatted text, RTF & HTML texts, using common text preparation tools, Conversion to and from of various text formats, using standard software, Object Linking and Embedding concept, Basics of font design, overview of some fonts editing and designing tools, Understanding & using various text effects.

Images – importance of graphics in multimedia, Vector and Raster graphics, image capturing methods – scanner, digital camera etc. various attributes of Images – size, color, depth etc, Various Image file format – BMP, DIB, EPS, CIF, PEX, PIC, JPG, TGA, PNG and TIF format – their features and limitations, graphic file formats conversions, processing images with common software tools such as Photoshop, Paint Shop pro, Corel draw etc..

UNIT-II

Sound: Sound and it Attributes, Mono V/s Stereo sound, Sound channels, Sound and its effect in multimedia, Analog V/s Digital sound, Basics of digital sounds-Sampling, Frequency, Sound Depth, Channels, Sound on PC, Sound standards on PC, Capturing and Editing sound on PC, Overview and using some sound recording, editing software. Overview of various sound file formats on PC – WAV, MP3, MP4, Ogg Vorbose etc.

Animation: Basics of animation, Principle and use of animation in multimedia, Effect of resolutions, pixel depth, Images size on quality and storage. Overview of 2-D and 3-D animation techniques and software- animation pro, 3D studio & Paint Shop pro animator.

Animation on the Web – features and limitations, creating simple animations for the Web using GIF Animator and Flash.

UNIT–III

Video: Basics of Video – Analog and Digital Video, How to use video on PC. Introduction to graphics accelerator cards, DirectX Introduction to AV/DV and IEEE1394 cards , Digitization of analog video to digital video, Interlacing and non-interlacing, Brief note on various video standards – NTSC, PAL, SECAM, HDTV, Introduction to video capturing Media & instrument – Videodisk, DVCAM,

Camcorder, Introduction to digital video compression techniques and various file formats – AVI, MPEG, MOVE Real Video.

Brief Introduction to video editing and movie making tools – Quick time, video for windows & Adobe premier.

UNIT–IV

Authoring tools for CD Based Multimedia: Type of multimedia authoring tools, key factors of selecting CD based multimedia authoring tools, Planning and distribution of a multimedia project. Multimedia development team & skills requirement, Stages in designing & producing multimedia products for CD, Testing of product, distribution of multimedia product, various formats of CD's and DVD's.

UNIT – V

Multimedia on the Web: Bandwidth relationship, broadband technologies, Text in the web – Dynamic and embedded font technology, Audio on the Web – Real Audio and MP3/MP4, Audio support in HTML, Graphics – HTML safe color palate, Interlaced V/s Non interlaced model, Graphics support in HTML, Image Map, Video on the Web – Streaming video, Real Video, MPEG and SMIL, Virtual Reality on the Web.

TEXT AND REFERENCE BOOKS :

2 ***Multimedia: Making It Work*** *(4th Edition) – by Tay Vaughan, Tata Mcgraw Hills.*

3 ***Multimedia In Action –*** *James E Shuman – Vikas Publishing House.*

4 ***Multimedi Basics –*** *Volume – 1 Technology, Andreas Holzinger, Firewall Media(Laxmi Publications Pvt. Ltd) New Delhi.*

BCA-306(A)
FINANCIAL MANAGEMENT & ACCOUNTANCY

Max marks-50

Note : The Question Paper setter is advised to prepare unit-wise question with the provision of internal choice. Only Simple calculator is allowed not Scientific calculator.

UNIT - I

1. Financial Accounting :
   Meaning and Nature, Accounting Principles underlying the preparation of financial statements.
2. Preparation of Financial Statements :
   A Synoptic view-Profit and Loss account, Balance Sheet

UNIT - II

3. Financial statement Analysis
   Ratio analysis (Liquidity, Solvency, Profitability, Efficiency), Statement of Changes in financial position-working capital basis.
4. Conceptual Framework of Cost Accounting
   Meaning nature and need of cost accounting, Elements of cost, Preparation of cost – sheet, Cost concept –Fixed and variable costs, sunk costs, Out of pocket costs, Relevant and irrelevant costs, Opportunity and imputed costs.

UNIT - III

5. Cost – volume Profit (CVP) relationship
   Break-even analysis; (single and multiple products), Determination of sales volume to attain desired profits, Cash break-even point. Graphic presentation of CVP relationship. Assumptions and limitation of break-even analysis

UNIT - IV

6. Budgeting :
   Definition and objective. Preparation of various types of budgets including cash budget. Fixed and flexible budgets.

UNIT - V

7. Cost Accumulation System
   Job and Process (simple treatment)
8 Variable and absorption costing systems
   Comparison for income determination (simple treatment), Variable costing as a tool of decision-making