SCHEME OF STUDIES & EXAMINATIONS

Department: Bachelor of Computer Applications – 3rd Semester

Sr. No	Course No.	Course Title	Teaching Schedule			Marks of class work	Examination Marks		Total	Credit	Exam Duration
			L	T	P		Theory	practical			
1	BCA-201 B	Programming Languages	3	1	-	25	75	-	100	4	3
2	BCA-203 B	Computer System Architecture	3	1	-	25	75	-	100	4	3
3	BCA-205 B	Fundamentals of Database Management System	3	1	-	25	75	-	100	4	3
4	BCA-207 B	Data Structures	3	1	-	25	75	-	100	4	3
5	BCA-209 B	Information Systems Analysis & Design	3	1	-	25	75	-	100	4	3
6	BCA-225 B	SOFTWARE LAB.-IV(MS Access) (BASED ON BCA-205)	-	-	2	20	-	30	50	1	3
7	BCA-227 B	SOFTWARE LAB.-V (BASED ON BCA-207)	-	-	2	20	-	30	50	1	3
8	GES – 101B*	Environmental Studies	3	-	-	25*	75*	-	100*	-	3
Total			18	5	4	165	375	60	600	22	

NOTE:

*The Environmental studies GES-101 B is compulsory & qualifying course only.

SYLLABUS: BCA

Department: Bachelor of Computer Applications – 3rd Semester

Subject: Programming Languages (Theory) Subject Code: BCA-201B

Detailed Content

Unit No.1 Introduction

- Topic No.1 : Syntactic and semantic rules of a programming language
- Topic No.2 : Characteristics of a good programming language
- Topic No.3 : Programming language translators compiler & interpreters
- Topic No.4 : Elementary data types: Data objects,Variable,Constants,Data types
- Topic No.5 : Specification & implementation of elementary data types
- Topic No.6 : Declarations
- Topic No.7 : Data types
- Topic No.8 : Type conversions
- Topic No.9 : Assignment and initialization
- Topic No.10: Numeric data types
- Topic No.11: Enumerations
- Topic No.12: Booleans & characters

Unit No.2 Structured Data Objects

- Topic No.13: Structured data objects and data types
- Topic No.14: Specification and implementation of structured data types
- Topic No.15: Declaration and type checking of data structure
- Topic No.16: Vector and arrays
- Topic No.17: Records and Character strings
- Topic No.18: variable size data structures
- Topic No.19: Union
- Topic No.20: Pointer & programmer defined data objects
- Topic No.21: Sets
- Topic No.22: Files
- Topic No.23: Evolution of data type concept
- Topic No.24: Abstraction
- Topic No.25: Encapsulation & information hiding
- Topic No.26: Subprograms
- Topic No.27: type definitions
- Topic No.28: Abstract data types

Unit No.3 Sequence Control

- Topic No.29: Implicit & explicit sequence control
- Topic No.30: sequence control within expressions
- Topic No.31: sequence control within statement
- Topic No.32: Subprogram sequence control: Simple call return,Recursive subprograms,Exception & exception handlers,Co-routines,Sequence control
- Topic No.33: Names & referencing environment
- Topic No.34: Static & dynamic scope
- Topic No.35: Block structure
- Topic No.36: Local data & local referencing environment
- Topic No.37: Shared data: Dynamic scope,Static scope

Unit No.4 Storage Management

Topic No.38: Major runtime elements requiring storage
Topic No.39: Programmer & system controlled storage management & phases
Topic No.40: Static storage management
Topic No.41: Stack based storage management
Topic No.42: Heap storage management
Topic No.43: Variable & fixed size elements
Topic No.44: Introduction: Procedural,Non-procedural,Structured,Functional,Object oriented programming language
Topic No.45: Comparison of C & C++ programming languages

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

TEXT/REFERENCE BOOKS:

• **P**rogramming languages Design & implementation by T.W. .Pratt, 1996, Prentice Hall Pub.
• Programming Languages – Principles and Paradigms by Allen Tucker & Robert Noonan, 2002, TMH,
• Fundamentals of Programming languages by Ellis Horowitz, 1984, Galgotia publications (Springer Verlag),
• Programming languages concepts by C. Ghezzi, 1989, Wiley Publications.,
• Programming Languages – Principles and Pradigms Allen Tucker , Robert Noonan 2002, T.M.H.

NOTE:

Eight questions will be set in all by the examiners taking at least one question from each unit. Students will be required to attempt five questions in all**.**

Campus
P M College of Engineering
Kami Road, Sonepat (Delhi-NCR), Haryana – 131001, India
Mob: +91-9812816666, +91-9812814444
Ph: +91-0130-2203501, Fax : +91-0130-2203510
Website: www.pmkami.com
E-mail: director@pmkami.com

Subject: Computer System Architecture (Theory) Subject Code: BCA-203B

Detailed Content

Unit No.1 Computer Organization

Topic No.1 : Introduction to computer & CPU
Topic No.2 : Stored program concept: Von Neumann Architecture
Topic No.3 : Introduction to Flynn's classification SISD,SIMD,MIMD register transfer& micro operations
Topic No.4 : Introduction to registers
Topic No.5 : Register transfer language
Topic No.6 : Data movement among registers and memory
Topic No.7 : Micro operations: Introduction to micro operations
Topic No.8 : Types of micro operations: Logic operations,Shift operations,Arithmetic & shift operations
Topic No.9 : Common Bus System: Introduction to common bus system,Types of buses,16 bit common bus system
Data movement among registers using bus

Unit No.2 Basic Computer Instruction

Topic No.10: Introduction to Instruction
Topic No.11: Types of Instructions
Topic No.12: Instruction cycle
Topic No.13: Instruction formats
Topic No.14: Interrupt: Introduction to Interrupt & Interrupt cycle
Topic No.15: Design of Control unit: Introduction to Control unit,Types of control unit
Topic No.16: Addressing modes: Introduction & different types of addressing modes

Unit No.3 I/O Organization

Topic No.17: I/O interface unit
Topic No.18: Types of ports
Topic No.19: Concept of I/O bus
Topic No.20: Isolated I/O versus memory mapped I/O
Topic No.21: I/O data transfer techniques: Programmed I/O,Interrupt Initiated I/O,DMA controller & IOP
Topic No.22: Synchronous & Asynchronous data transfer: Concept of Strobe & handshaking,Source & destination initiated data transfer

Unit No.4 Stack Organization

Topic No.23: Memory stack & register stack memory organization: Memory hierarchy,Main memory, Associative memory
Topic No.24: Cache memory: Replacement algorithms
Topic No.25: Cache memory Techniques: Direct mapping,Associative mapping & SetAssociative mapping
Topic No.26: Harvard Architecture
Topic No.27: Mobile devices architecture
Topic No.28: Layered approach architecture

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

TEXT/REFERENCE BOOKS:

1. Computer System Architecture, M.M. Mano, Third Edition, PHI

2. Computer Organization and Architecture, J.P. Hayes, Third Edition, TMH
3. Computer Organization and Architecture, Stallings, Eighth Edition, PHI

NOTE:

Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

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Ph: +91-0130-2203501, Fax : +91-0130-2203510
Website: www.pmkami.com
E-mail: director@pmkami.com

Subject: Fundamentals of Database Management Systems (Theory) Subject Code: BCA-205B

Detailed Content

Unit No.1 Basic Concepts

- Topic No.1 : Data
- Topic No.2 : Information
- Topic No.3 : Records & files
- Topic No.4 : Traditional file based Systems
- Topic No.5 : Open & closed system Based approach: Limitations of file based approach
- Topic No.6 : Database approach: Characteristics of database approach,Advantages & disadvantages of database system
- Topic No.7 : Components of database system
- Topic No.8 : Database management system(DBMS)
- Topic No.9 : Components of DBMS environment
- Topic No.10: DBMS functions & components
- Topic No.11: DBMS users
- Topic No.12: Advantages & disadvantages of DBMS
- Topic No.13: DBMS languages
- Topic No.14: Roles in the database environment: Data & database administrator
- Topic No.15: Database designers
- Topic No.16: Application developers & users

Unit No.2 Database System Architecture

- Topic No.17: Three levels of Architecture: External,Conceptual & Internal levels
- Topic No.18: Schemas
- Topic No.19: Mappings & Instances
- Topic No.20: Data Independence: Logical & Physical data independence
- Topic No.21: Classification of database management system
- Topic No.22: Centralized & client server architecture to DBMS
- Topic No.23: Records based data models
- Topic No.24: Object based data models
- Topic No.25: Physical data models & conceptual modeling

Unit No.3 Entity-Relationship Model

- Topic No.26: Entity Types
- Topic No.27: Entity sets
- Topic No.28: Attributes relationship types
- Topic No.29: Relationship instances & ER diagram
- Topic No.30: Abstraction & Integration
- Topic No.31: Basic concepts of Hierarchical & network data model
- Topic No.32: Relational data model: Brief history,Relational model terminology-Relational data structure
- Topic No.33: Database relations
- Topic No.34: Properties of relations
- Topic No.35: Keys
- Topic No.36: Domains
- Topic No.37: Integrity
- Topic No.38: Constraints over relations

Unit No.4 Database Protection

- Topic No.39: Database Protection: Recovery,Concurrency,Security,Integrity,Control
- Topic No.40: Distribute database: Structure of distributed database,Design of distributed databases

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

TEXT/REFERENCE BOOKS:

1. Korth, Silberschatz, Database System Concepts, 4th Ed., TMH.
2. Elmasri&Navathe: Fundamentals of Database Systems, 4th Ed., A. Wesley

NOTE:

Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

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Website: www.pmkami.com
E-mail: director@pmkami.com

Department: Bachelor of Computer Applications – 2ND Semester

Subject: Data Structures (Theory) Subject Code: BCA-207B

Detailed Content

Unit No.1 Introduction:

- Topic No.1 : Elementary data organization
- Topic No.2 : Data Structure definition
- Topic No.3 : Data type vs. data structure
- Topic No.4 : Categories of data structures
- Topic No.5 : Data structure operations
- Topic No.6 : Applications of data structures
- Topic No.7 : Algorithms complexity
- Topic No.8 : time-space tradeoff

Unit No.2 Arrays

- Topic No.9 : Introduction
- Topic No.10: Linear arrays
- Topic No.11: Representation of linear array in memory
- Topic No.12: Address calculations
- Topic No.13: Traversal in an array
- Topic No.14: Insertions in an array
- Topic No.15: Deletion in an array
- Topic No.16: Multidimensional arrays
- Topic No.17: Sparse arrays
- Topic No.18: Linked List Introduction
- Topic No.19: Array vs. linked list
- Topic No.20: Representation of linked lists in memory
- Topic No.21: Traversal in a linked list
- Topic No.22: Insertion in a linked list
- Topic No.23: Deletion in a linked list
- Topic No.24: Searching in a linked list
- Topic No.25: Header linked list
- Topic No.26: Circular linkedlist
- Topic No.27: Two-way linked list
- Topic No.28: Threaded lists
- Topic No.29: Garbage collection
- Topic No.30: Applications of linked lists

Unit No.3 Stack & Queues

Topic No.31: Introduction

Topic No.32: Array and linked representation of stacks

Topic No.33: Operations on stacks

Topic No.34: Applications of stacks

Topic No.35: Polish notation

Topic No.36: Recursion.

Topic No.37: Introduction

Topic No.38: Array and linked representation of queues

Topic No.39: Operations on queues

Topic No.40: Deques

Topic No.41: Deques advantages

Topic No.42: Priority Queues

Topic No.43: Applications of queues

Unit No.4 Trees & Graphs

Topic No.44: Introduction

Topic No.45: Definition

Topic No.46: Representing Binary tree in memory

Topic No.47: Traversing binary trees

Topic No.48: Traversal algorithms using stacks

Topic No.49: Introduction

Topic No.50: Graph theory terminology

Topic No.51: Sequential of graphs

Topic No.52: linked representation of graphs

STUDY SCHEME				EVALUATION SCHEME			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3hrs	100

TEXT/REFERENCE BOOKS:

1. Seymour Lipschutz, “Data Structure”, Tata-McGraw-Hill

NOTE:

Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit.

SYLLABUS: BCA

Department: Bachelor of Computer Applications – 3rd Semester

Subject: Information Systems Analysis & Design (Theory) Subject Code: BCA-209B

Detailed Content

Unit No.1 System Concept

- Topic No.1 : Definition
- Topic No.2 : Characteristics
- Topic No.3 : Elements of system
- Topic No.4 : Physical & abstract system
- Topic No.5 : Open & closed system
- Topic No.6 : Man-made information systems
- Topic No.7 : Various phases of system development
- Topic No.8 : Considerations for system planning & control for system success
- Topic No.9 : Role of system analyst

Unit No.2 System Planning

- Topic No.10: Bases for planning in system analysis: Dimensions of planning
- Topic No.11: Investigation: Determining user's requirements & analysis,Fact-finding process & techniques
- Topic No.12: Data flow diagram
- Topic No.13: Data dictionary
- Topic No.14: IPO & HIPO charts
- Topic No.15: Gantt charts
- Topic No.16: Pseudo codes
- Topic No.17: Flow charts
- Topic No.18: Decision tree
- Topic No.19: Decision tables
- Topic No.20: Feasibility study: Technical,Operational,Economic Feasibilities

Unit No.3 Cost/Benefit Analysis

- Topic No.21: Data analysis cost & benefit analysis of a system
- Topic No.22: Input/Output & form design
- Topic No.23: File organization & database design: Introduction to files & database,File structure & organization,Objectives of database design,Logical & physical view of data

Unit No.4 System Testing

- Topic No.24: Introduction
- Topic No.25: Objectives of testing
- Topic No.26: Test planning
- Topic No.27: Testing techniques
- Topic No.28: Quality assurance: Goal of quality assurance,Levels of quality assurance
- Topic No.29: System implementation & software maintenance: Primary activities in maintenance,Reducing maintenance costs

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

TEXT/REFERENCE BOOKS:

1. Awad M. Elias, "System Analysis and Design", Galgotia Publication

NOTE:

Eight questions will be set by the examiners taking at least two questions from each unit. Students will be required to attempt five questions in all taking at least one question from each unit

SYLLABUS: BCA

Department: Bachelor of Computer Applications – 3rd Semester

Subject: Fundamentals of Database Management Systems LAB Subject Code: BCA-225B

Detailed Content

List of Programs:

1. Add a record in the database
2. Delete a record in the database
3. Modify the record in the database
4. List all the records of database in ascending order.
5. How SQL Constraints can be used in database
6. How tables can be created in database
7. How database can be created
8. How DML commands can be used in database
9. How DDL commands can be used in database
10. How E-R diagram can be used to create database & its records
11. How SQL commands can be used in MS-Access
12. How Ms-Access can be used

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
		2	1	20	30	3 hours	50

NOTE:

Students are required to attempt at least 10 exercises based on the syllabi of subject "BCA-205"

SYLLABUS: BCA

Department: Bachelor of Computer Applications – 3rd Semester

Subject: DATA STRUCTURE LAB Subject Code: BCA-227B

Detailed Content

List of Programs:

1. Write a program to perform binary search in an array.
2. Write a program to perform binary search using recursion.
3. Write a program to perform linear search in 2D array.
4. Write a program to perform various operations on matrices.
5. Write a program to swap two nos. using calls by value and reference.
6. Write a program to implement bubble sort.
7. Write a program to implement insertion sort.
8. Write a program to implement selection sort.
9. Write a program of link list implementation of a stack.
10. Write a program of link list implementation of a queue.
11. Write a program of array implementation of a stack.
12. Write a program of array implementation of a queue.
13. Write a program to search an element in a link list.
14. Write a program to maintain a link list.
15. Write a program to implement BST

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
		2	1	20	30	3 hours	50

NOTE:

Students are required to attempt at least 10 exercises based on the syllabi of subject “BCA-207”.

SYLLABUS: BCA

Department: Bachelor of Computer Applications – 3rd Semester

Subject: Environment Studies(Theory) Subject Code: GES-201B*

Detailed Content

UNIT 1: The Multidisciplinary Nature Of Environmental Studies
- Topic No.1 : Definition , scope and importance of environment.
- Topic No.2 : Need for public awareness

UNIT 2: Natural Resources
- Topic No 3 : Renewable and non renewable resources, Forest resources
- Topic No.4 : Water resources and Mineral resources
- Topic No.5 : Food resources
- Topic No.6 : Energy resources
- Topic No.7 : Land resources and Role of and individual in conversation of natural resources
- Topic No.8 : Equitable use of resources for sustainable life style

UNIT 3: ECOSYSTEM
- Topic No.9 : Concept, structure and function of an eco system
- Topic No.10: Food chains and Food web
- Topic No.11: Energy flow in the ecosystem
- Topic No.12: Biogiochemical cycles
- Topic No.13: Ecological succession
- Topic No.14: Ecological pyramids and ideal ecosystem
- Topic No.15: Forest ecosystem
- Topic No.16: Desert, Aquatic and tundra ecosystem

UNIT 4:- Biodiversity and its conservation
- Topic No.17: Types of biodiversity
- Topic No.18: Biological classification of india and value of biodiversity
- Topic No.19: Biodiversity at Globe National local levels
- Topic No.20: Hot spot of biodiversity
- Topic No.21: Endangered and endemic speceis ofindia
- Topic No.22: Conversation of biodiversity

UNIT 5: ENVIRONMENTAL POLLUTION
- Topic No.23: Air pollution and Water pollution
- Topic No.24: Soil and Marine Pollution
- Topic No.25: Noise pollution and thermal pollution
- Topic No.26: Nuclear hazard and solid waste management
- Topic No.27: Role of an individual in prevention of pollution and case study of pollution
- Topic No.28: Disaster management

UNIT 6:- SOCIAL ISSUESAND THE ENVIRONMENT
- Topic No.29: From unsustainable to sustainable development
- Topic No.30: Urban problem related to energy
- Topic No.31: Water conservation and management
- Topic No.32: Resettlement and Rehabilitation of people
- Topic No.33: Environment ethic and climate change
- Topic No.34: Wasteland reclamation
- Topic No.35: Environment protection Act
- Topic No.36: Issues involved in enforcement and environmental Legislation

UNIT 7:- HUMAN POPULATION AND THE ENVIRONMENT
- Topic No.37: Population growth

Topic No.38: Environment and human health
Topic No.39: Human right and value education
Topic No.40: AIDS, Women and child welfare
Topic No.41: Role of information technology in environment
Topic No.42: Role of information technology in human health

Study Scheme				Evaluation Scheme			Total Marks
Lectures per week				Internal Assessment	External Assessment (Examination)		
L	T	P	Credits	Max. Marks	Max. Marks	Exam Duration	
3	1	-	4	25	75	3 hours	100

TEXT/REFERENCE BOOKS:

1. Agarwal, K.C. 2001, Environmental Biology, Nidi Pub. Ltd. Bikaner.
2. Bharucha, Franch, The Biodiversity of India, Mapin Publishing Pvt. Ltd., Ahmedabad – 380013, India .
3. Brunner R.C. 1989, Hazardous Waste Incineration, Mc. Graw Hill Inc. 480p.
4. Clark R.S., Marine Pllution, Slanderson Press Oxford (TB).
5. Cunningham, W.P. Cooper, T.H. Gorhani, E & Hepworth, M.T. 2001, Environmental Encyclopedia, Jaico Pub. House, Mumbai. 1195p.
6. De A.K., Environmenal Chemistry, Wiley Eastern Ltd.
7. Down to Earth, Centre for Science and Environment ®.
8. Gleick, H.P., 1993. Water in Crisis, Pacific Institute for Studies in Dev., Environment & Security, Stockholm Env. Institute, Oxford Univ., Press 473p.
9. Hawkins R.E. Encyclopedia of Indian Natural History, Bomaby Natural History Scociety, Bombay (R).
10. Heywood, V.H. & Watson, R.T. 1995. Global Biodiversity Assessment. Cambridge Univ. Press 1140p.
11. Jadhav, H & Bhosale, V.M. 1995, Environmental Protection and Laws, Himalaya Pub. House, Helhi 284p.
12. Mckinney, M.L. & Schoch, RM 1996, Environmental Sciences Systems & Solutions, Web enhanced Edition.

NOTE:

Examiner will set eight questions taking atleast one question from each unit. Students will be required to attempt five Questions. This paper is a qualifying examination.