



MAHARAJA KRISHNAKUMARSINHJI BHAVNAGAR UNIVERSITY

NAAC Accreditation Grade "B"

(With effect from Academic Year 2014-2015)

Academic Council: 23 / 11 / 2013, R.No. (2)

S.Y. B.C.A.

Paper No	Title of the Paper	Total Marks	Passing Standard	Total Teaching Hours
BCA-201	Data and File Structure	100	40	3 hrs. per week * 30 weeks = 90 hrs.
BCA-202	System Analysis and design	100	40	3 hrs. per week * 30 weeks = 90 hrs.
BCA-203	Object oriented programming with C++	100	40	3 hrs. per week * 30 weeks = 90 hrs.
BCA-204	Operating System	100	40	3 hrs. per week * 30 weeks = 90 hrs.
BCA-205	Application Development Using VB.NET	100	40	3 hrs. per week * 30 weeks = 90 hrs.
BCA-206	Web Application Development using PHP	100	40	3 hrs. per week * 30 weeks = 90 hrs.
BCA-207	Practical Based on 201,203,205,206	100	40	6 hrs. per week * 30 weeks = 180 hrs.



S.Y. B.C.A.

Paper – 201 Data and File Structure

Total Marks: 100

Unit	Detailed Syllabus	Marks
Unit -1	Introduction to Data Structure <ul style="list-style-type: none">♣ Definition, Data Types(Primitive, Non- Primitive), Type of Data Structures (Linear, Non-Linear, Static, Dynamic)♣ Logical and Control Structures of data♣ Time and space efficiency of Algorithms♣ Applications, Aims & Goals of Data Structure♣ Storage Representation of data in 1, 2, and Multidimensional Array and Sparse Matrix	20
Unit-2	Searching, Sorting and Merging Techniques: <ul style="list-style-type: none">♣ Sequential search, Binary Search♣ Bubble, Selection sorts♣ Insertion , Shell, Quick sorts♣ Merge sort♣ Applications, merits & demerits , performance analysis and comparison of all above techniques	20
Unit-3	Linear Data Structure <ul style="list-style-type: none">♣ Various forms of Linked List (Singly, Doubly, Circular, Doubly Circular, Inverted)♣ Stack: -Basic Operations using array and linked list (Push, Pop, Peep, Display), Applications of Stack♣ Polish Notations: Conversion of expression (Infix, Postfix, Prefix) Evaluate Postfix Expressions (using Hand, Stack) Method.♣ Queue: Basic Operations using array and linked list (Insert, Delete, Update, Search, Sort, Display), Concept of Priority Queue, Circular Queue and Double Ended Queue.♣ Applications of all above Linear Data Structures.	20
Unit-4	Non-Linear Data Structure: <ul style="list-style-type: none">♣ Introduction of Tree: Definitions, Basic Tree Terminology ,Different graphical representations techniques♣ Binary Tree, Full, Complete, in-complete, balance, imbalance♣ Memory Representations of Binary Tree(Array & Linked) and its♣ merits & demerits of representations, Basic Operations on Binary Tree using linked list (Create, Insert, Display, Search, Update)♣ Binary Tree Traversal algorithms: In order, pre- order, post order, Basic Operations on BST using linked list (Insert, Display, Search, Update)♣ Introduction of Graph, Properties of graph & Terminology, Adjacency & Incidence Matrices Representation of Graph. Graph Traversal Techniques(DFS & BFS)♣ Applications, Merits & Demerits of all above trees and graphs.	20
Unit-5	Introduction to File Structure <ul style="list-style-type: none">♣ Storage device and their Characteristics.♣ Concepts of field ,record and file♣ Fixed and variable length record.♣ Primary and Secondary key♣ Introduction to External Sorting.	20

Reference / Text-Books / Additional Reading:

1. Data & File Structure: Tremblay & Sorenson
2. Expert in Data Structure with C: R. B. Patel (Second or above editions)
3. Data & File Structure: A. A. Puntambekar



S.Y. B.C.A.

Paper – 202 System Analysis & Design

Total Marks: 100

Unit	Detailed Syllabus	Mark
Unit-1	Structure of Business Information System <ul style="list-style-type: none">♣ Business systems concepts♣ Categories of Information systems♣ Introduction of System Analysis & Design,♣ System Development Strategies – Classical Method(SDLC), Structured♣ Analysis Development Method, System Prototype Method	20
Unit-2	Requirement Analysis & Determination <ul style="list-style-type: none">♣ Fact Finding Techniques♣ Tools for Analysis – Decision Trees, Decision Tables, Structured English♣ Data Flow Diagrams & Data Dictionary	20
Unit-3	Design of Input & Output <ul style="list-style-type: none">♣ Output objectives, types of output, Key output questions♣ Output format - Detailed report & Summary report, Tabular output &♣ Graphics output♣ Input validation♣ Error checking methods and Error messages♣ Dialogue design - Data entry dialogues	20
Unit-4	Design of Database & Software <ul style="list-style-type: none">♣ System development in a database environment♣ Design of Database – Normalization♣ Top-Down structure of modules, Coupling & Cohesion, Span of control,♣ Module size, Shared modules♣ Software Design tools - Structured flowcharts, HIPO, Warnier/Orr diagrams	20
Unit-5	Testing , Implementation and case study <ul style="list-style-type: none">♣ Level of testing - Unit testing, Systems testing, & special systems testing♣ Methods of system conversion - parallel systems, direct conversation, pilot system, phase-in.♣ Case study of small system according to SDLC	20

Reference / Text-Books / Additional Reading:

1. James A Senn: Analysis and Design of Information Systems McGraw Hill International Edition
2. Yourdon E. and Constantine L. L:Structured Analysis and Design, Yourdon Press, New York.
3. Kendall & Kendall : System Analysis and design , PHI



S.Y. B.C.A.

Paper – 203 Object Oriented Programming with "C"

Total Marks: 100

Unit	Detailed Syllabus	Mark
Unit 1	An Overview of OOP <ul style="list-style-type: none">♣ An Overview of POP and OOP♣ Characteristics & Advantages of POP and OOP♣ Data Types, Variables, Constants, Expression, Statements and operators, structure and function Basic Concept of OOP.	20
Unit 2	Classes and Objects <ul style="list-style-type: none">♣ Declaration and creation of Classes and Objects♣ Member function, static data member and member function.♣ Constructor and destructor , Type of constructor♣ Friend Function, Inline function, function & constructor overloading♣ Memory Management	20
Unit 3	Operator Overloading And Type Conversion <ul style="list-style-type: none">♣ Basic Concept of Operator overloading♣ Unary and Binary Operator Overloading♣ Introduction of type conversion♣ Categories of type conversion (Basic to class, Class to basic, Class to class)	20
Unit 4	Inheritance & polymorphism <ul style="list-style-type: none">♣ Inheritance Types of inheritance♣ Pointer in C++ , this pointer♣ Polymorphism (Compile time and Run time polymorphism)♣ Virtual functions	20
Unit 5	Stream Handling and graphics with C++ <ul style="list-style-type: none">♣ Input output stream class and stream handling (Formatting input and output)♣ File Stream classes (ifstream, ofstream and fstream)♣ Basic File operations (opening, reading, writing and closing)♣ Sequential and random access file♣ Graphics programming using built in function.	20

Reference / Text-Books / Additional Reading:

1. E.Balaguruswami: Object Oriented Programming with C++ Mc Graw-Hill
2. Robert Lafore: Object Oriented Programming with C++ Ggotia Pub.
3. Rajaraman: Object Oriented Programming with C++ New age Internationa



S.Y. B.C.A.

Paper – 204 Operating System

Total Marks: 100

Unit	Detailed Syllabus	Mark
Unit – 1	Introduction to operating systems <ul style="list-style-type: none">♣ Definition and Function of operating systems.♣ Evolution of operating system: Batch system, Multi programmed system, time sharing and PCs♣ Introduction to basic terms & batch processing system: Jobs, Processes files, command interpreter.♣ Different types of operating system-real time systems, parallel, distributed system.♣ Operating system structure-monolithic layered, virtual machine & Client server.	20
Unit – 2	Process Scheduling <ul style="list-style-type: none">♣ Process states, Queuing diagram, Interrupt mechanism.♣ Schedulers and Dispatcher♣ Scheduling algorithms (FIFO, SJF, Priority, RR etc.) with Performance evaluation♣ Threads♣ Deadlock: safe and unsafe state, Necessary conditions to occur deadlock, Deadlock Prevention, avoidance, detection, and recovery	20
Unit – 3	Memory Management <ul style="list-style-type: none">♣ Logical & Physical address space, Swapping♣ Paging with protection♣ Segmentation.♣ Concepts of Virtual memory, Page replacement algorithms (FCFS, LRU, OPR).♣ Cache memory, hierarchy of memory types.	20
Unit – 4	File and Directory Management <ul style="list-style-type: none">♣ File format, Characteristics of file, File operations, File system structure♣ File access methods: Sequential , direct and Index sequential♣ Directory structure: single level, two level, tree level, Directory operations♣ Directory implementation: Linear list, Hash table♣ Disk Space Allocation Method: Continuous, Linked, Index, Free Space Management	20
Unit – 5	I/O Management <ul style="list-style-type: none">♣ Typical PC Bus structure♣ Pooling and Interrupts♣ DMA Controller♣ Kernel I/O Subsystem: I/O Scheduling, Buffering, Caching, Spooling, Error Handeling♣ Mass Storage Structure and Disk scheduling algorithm (FIFO, SSTF, SCAN, C-SCAN etc.)	20

Reference / Text-Books / Additional Reading:

1. Silberschatz, Galvin and Gange: Operating System Concepts, Wesley.
2. Tanenbaum A.S., "Modern Operating Systems", 4th Edition, PHI, 2001
3. Stalling W, "Operating Systems", 6th edition, Prentice Hall India



S.Y. B.C.A.

Paper – 205 Application Development Using VB.NET

Total Marks: 100

Unit	Detail Syllabus	Marks
Unit-1	Introduction <ul style="list-style-type: none">♣ The .NET framework & Common Language Runtime♣ Net Assembly♣ Visual Basic Language – Operators, Conditions & Loops♣ Procedures & Functions, Understanding Scope, Exception handling♣ Console application development	20
Unit-2	Getting Started with VB .NET <ul style="list-style-type: none">♣ Concept of event handling♣ Creating forms in application♣ Basic Controls– Label,Text Boxes, Link Labels,Button,♣ Other common controls – Check Boxes, Checked list box, Radio Buttons, ListBoxes, combo box, Scrollbar control, Timer, Group box, Panel etc.♣ Built in function – String, Date, Math's, Format function etc.	20
Unit-3	Advance .Net Controls <ul style="list-style-type: none">♣ MDI and SDI Form. Main menu strip, context menu.♣ Picture box, Month and Calendar♣ Built in Dialog box (Open dialog, Save dialog, Font dialog, Color dialog, Print dialog)♣ Track bar, Notify Icon, Tools Tip, Progress bar♣ Date & Time Control, Toolbar, Tab control	20
Unit-4	Object Oriented Programming <ul style="list-style-type: none">♣ Classes & Objects♣ Fields, Properties, Methods & Events♣ Abstraction, Encapsulation, Inheritance & Polymorphism♣ Overloading, Overriding & shadowing♣ Constructors & Destructor	20
Unit-5	Database Access with ADO .NET <ul style="list-style-type: none">♣ Accessing data with Server Explorer♣ Accessing data with Data Adaptors & Datasets♣ Working with ADO .NET and Database Binding Controls♣ Concept of Dataset, Data Tables and Database programming using code.♣ Report Generation using crystal report.♣ Small application development	20

Reference / Text-Books / Additional Reading:

1. Steven Holzner: Visual Basic .NET Programming Black Book DeramTech Press.
2. ROD STEPHENS: VISUAL BASIC 2005 PROGRAMMER'S
3. KOGEN SOLUTIONS INC.: VISUAL BASIC 2005 WITH .NET 3.0 FRAMEWORK IN SIMPLE STEPS



S.Y. B.C.A.

Paper – 206 Web Application Development Using PHP

Total Marks: 100

Unit	Detailed Syllabus	Marks
Unit – 1	Internet Fundamentals <ul style="list-style-type: none">♣ Internet, Intranet, Extranet♣ Internet Applications (WWW, E-mail, FTP, IRC, Web Chat, Newsgroup, UseNet, BBS, NetMeeting, Video Conferencing)♣ Email protocols (SMTP, POP3, IMAP)♣ Introduction to TCP/IP, DNS, MIME Types♣ Search Engines, Popular Search Engines and its working.	20
Unit – 2	HTML, DHTML and Java Script <ul style="list-style-type: none">♣ Basic Of HTML Formatting of text, working with Image, Hyperlink List, Tables d Frames, working with Form elements(Controls)♣ Java Script : Variable and Data Type Types of Operators Conditional Statements, Looping Statements♣ Array, Functions ,Events ,Message Box ,Objects Based Programming♣ Validation of form using JavaScript ,Different types of effects in designing using JavaScript	20
Unit – 3	Basic PHP Programming <ul style="list-style-type: none">♣ Fundamentals of PHP Variables, Constants, Global variables Server Variables♣ Conditional Statements Looping Statements♣ Concept of array, Types of Arrays (Numeric, Associative, Multidimensional)♣ Super Global Variables, For each loop♣ Built-in functions (String, Mathematical, Date & Time, Array, etc)	20
Unit – 4	Regular Expression <ul style="list-style-type: none">♣ Types of Regular Expressions , Functions used in Regular Expressions, Symbols used in Regular Expressions♣ Error Handling : Displaying Errors, Error Levels in PHP, Logging Errors, Ignoring Errors, Acting on Errors / Exceptions	20
Unit – 5	Working with Forms <ul style="list-style-type: none">♣ PHP – MYSQL Architecture♣ Creating Forms of Different Web applications , Login Form♣ Uploading Files to Web Server.♣ Database Interaction (With My SQL): Data base creation and SQL queries,♣ PHP-MySQL Architecture ,Creating & Connecting Database♣ Executing Commands on Database from the Front end♣ Small application development using php	20



Reference/Text Book/additional reading:

1. Ivan Bayross, Sharanam Shah: PHP 5.1 For Beginners, Shroff Publishers & Distributors (SPD)
2. Janet Valade: PHP5 & MYSQL Projects, Wiley Dreamtech
3. Dave W. Mercer: Beginning PHP5, Wiley India Edition
4. Steven Holzner: The Complete Reference PHP, Tata McGRAW – HiLL, New Delhi
5. Web enable commercial application development using html, java script, dhtml, php, by Ivan bayross, bpb publication
6. Complite reference HTML & CSS, Thomas A. Powell, McGRAW – HiLL Publication

S.Y. B.C.A.

Paper – 207 Practical

Total Marks: 100

Practical exercises of following theory papers are to be carried out by the students:

Title of the paper	Marks	Total Practical Hours
Data and File Structure (BCA201)	30	54
Object Oriented Programming with C++ (BCA203)	30	54
Application Development Using VB.NET (BCA205) OR Web Application Development Using PHP (BCA206)	40	36 + 36 = 72
Total	100	180