



**Punjab Technical University**  
**Jalandhar**

**Syllabus Scheme**

(1<sup>st</sup> to 6<sup>th</sup> Semester)

For

**Bachelor of Science**  
**Information Technology (B.Sc.-IT)**

Implemented

From Aug. 2005 and onward

*aw*  
Deputy Registrar  
I.K. Gujral Punjab Technical University  
Kapurthala-144603

**STUDY SCHEME FOR B.SC.(IT)**

CODE	SUBJECT	L	P	T	INTERNAL	EXTERNAL	TOTAL
BSIT(05)-101	Fundamentals of Information Tech.	30	30	60	25	75	100
BSIT(05)-102	Programming in C	30	30	60	25	75	100
BSIT(05)-103	Operating Systems	40	0	40	25	75	100
BSIT(05)-104	RDBMS-I	25	25	50	25	75	100
BSIT(05)-105	Communication & Soft Skills	30	0	30	50	0	50
BSIT(05)-105	Software Lab-I ( C )				25	75	100
BSIT(05)-106	Software Lab-II (RDBMS-1)				25	75	100
	<b>TOTAL</b>	<b>155</b>	<b>85</b>	<b>240</b>	<b>200</b>	<b>450</b>	<b>650</b>

**SEMESTER -2**

CODE	SUBJECT	L	P	T	INTERNAL	EXTERNAL	TOTAL
BSIT(05)-201	Digital Electronics Fundamentals	40	0	40	25	75	100
BSIT(05)-202	Data Structures through C	35	35	70	25	75	100
BSIT(05)-203	Web Technology-I	30	40	70	25	75	100
BSIT(05)-204	Desktop Publishing Tools	10	50	60	25	75	100
BSIT(05)-205	Software Lab-III (Data Structures)				25	75	100
BSIT(05)-206	Software Lab-IV (DTP,WEB)				25	75	100
	<b>TOTAL</b>	<b>115</b>	<b>125</b>	<b>240</b>	<b>150</b>	<b>450</b>	<b>600</b>

  
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**SEMESTER -3**

CODE	SUBJECT	L	P	T	INTERNAL	EXTERNAL	TOTAL
BSIT(05)-301	Computer System Architecture	40	0	40	25	75	100
BSIT(05)-302	Principles of Management	40	0	40	25	75	100
BSIT(05)-303	Programming in C++	40	40	80	25	75	100
BSIT(05)-304	RDBMS-II	40	40	80	25	75	100
BSIT(05)-305	Software Lab-V (RDBMS-II)				25	75	100
BSIT(05)-306	Software Lab-VI (C++)				25	75	100
	<b>TOTAL</b>	<b>160</b>	<b>80</b>	<b>240</b>	<b>150</b>	<b>450</b>	<b>600</b>

**SEMESTER -4**

CODE	SUBJECT	L	P	T	INTERNAL	EXTERNAL	TOTAL
BSIT(05)-401	VISUAL BASIC	40	40	80	25	75	100
BSIT(05)-402	Basic Mathematics-I	50	0	50	25	75	100
BSIT(05)-403	Microprocessor System	20	10	30	25	75	100
BSIT(05)-404	Web Technologies-II	40	40	80	25	75	100
BSIT(05)-405	Software Lab-VII (Web Tech.)				25	75	100
BSIT(05)-406	Minor Project(VB)				25	75	100
	<b>TOTAL</b>	<b>150</b>	<b>90</b>	<b>240</b>	<b>150</b>	<b>450</b>	<b>600</b>

  
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**SEMESTER -5**

CODE	SUBJECT	L	P	T	INTERNAL	EXTERNAL	TOTAL
BSIT(05)-501	CORE JAVA	40	50	90	25	75	100
BSIT(05)-502	WAP & WML	30	40	70	25	75	100
BSIT(05)-503	Computer Networks	40	0	40	25	75	100
BSIT(05)-504	Management Information Systems	40	0	40	25	75	100
BSIT(05)-505	Software Lab-VIII (WAP & WML)				25	75	100
BSIT(05)-506	Software Lab-IX (CORE JAVA)				25	75	100
	<b>TOTAL</b>	<b>150</b>	<b>90</b>	<b>240</b>	<b>150</b>	<b>450</b>	<b>600</b>

**SEMESTER -6**

CODE	SUBJECT	L	P	T	INTERNAL	EXTERNAL	TOTAL
BSIT(05)-601	Software Engineering & Project Management.	50	0	50	25	75	100
BSIT(05)-602	Advanced Java	50	60	110	25	75	100
BSIT(05)-603	C# WITH .NET	40	40	80	25	75	100
BSIT(05)-604	Major Project			0	100	200	300
	<b>TOTAL</b>	<b>140</b>	<b>100</b>	<b>240</b>	<b>175</b>	<b>425</b>	<b>600</b>

**Guidelines for Internal Assessment :**

The internal marks will be based on a continuous assessment and the following is to be adhered to :

- Test/Quiz's (15 Marks). Best 2 out of 3.
- Presentation/Reports/Home assignments (5 Marks)
- Class attendance/General behaviour (5 marks)

**Guidelines for External Practical / Viva-Voce :**

The external practical /viva-voce will be conducted as per the details mentioned above in study scheme by an external examiner appointed by the University.

  
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**BSIT(05)-101 FUNDAMENTALS OF INFORMATION TECHNOLOGY**

**INSTRUCTIONS FOR PAPER-SETTER**

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each section and Part B will carry 4 questions from each section.

**INSTRUCTION FOR CANDIDATES**

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

**Section I**

**UNDERSTANDING COMPUTERS:**

computer definition, characteristics of computers, evolution of computers, basic anatomy of computers,

**DATA REPRESENTATION:**

Number Systems, conversions from one number system to another, Character representation, Error detecting codes

**CPU:**

Control Unit, ALU, Instruction set, instruction representation, registers, CISC vs. RISC.

**MEMORY ORGANIZATION:**

Storage evaluation criteria, Main Memory, Secondary devices, mass storage devices.

**INPUT DEVICES:**

Keyboard devices, point and draw devices, scanning devices, voice recognition devices, vision input devices.

**OUTPUT DEVICES:** Display devices, Printers, Plotters, voice response system

**Section II**

**SOFTWARES:**

understanding relationship between hardware and software, type of software, languages.

**DISK OPERATING SYSTEM(DOS)**

Main Functions of Operating System; Resource Management; MS-DOS; Limitations of MS-DOS; Simple DOS Commands; Simple File Operations; Wild Cards; directory related Commands;

**WINDOWS:** Introduction to windows, overview of different of windows, Basic element of windows, customizing windows, working with windows, exploring control panel, managing files and folders, windows accessories.

**PRESENTATION PACKAGE:**

introduction to PowerPoint, PowerPoint window, Toolbars, their icons and commands, opening and creating a presentation, creating, deleting and copying slides, saving a presentation, different views of PowerPoint, designing presentation, inserting clipart, moving text, entering graphs, organization charts, customizing presentations, adding predefined shapes, creating slide shows, creating custom animations, rehearsing slide timings.

### Section III

#### WORD PROCESSING :

Word basics, starting word, different views of word document, word window, mouse and keyboard operation, menus, commands, toolbars and their icons, creating a new document, saving and opening a document, formatting font and paragraphs, formatting pages, printing documents, spelling checks, auto text and track changes, working with tables, inserting images, mail merge, macros, templates, wizards.

#### SPREAD SHEET PACKAGE:

Excel basics, starting excel, menus, commands, toolbars and their icons, working with cells, creating a new workbook, saving and opening a workbook, working with workbook, formatting cells, inserting rows and columns, printing, borders, Data sort, Data filters, functions, crating charts and graphs, pivot table reports, Data tables and scenarios, hyperlinks.

## BSIT(05) -102 PROGRAMMING WITH C

### INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each section and Part B will carry 4 questions from each section.

### INSTRUCTION FOR CANDIDATES

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

### Section I

#### Basics of programming languages and C

Introduction to Programming: Computer programming, Programming techniques, Procedural programming, Algorithms and Flowcharts

#### Fundamentals of C Languages:

Characters used in C, Identifiers, Keywords or reserved word, Tokens, Constants, variables, Variable declarations, Basic and additional data types, operations and expressions, Arithmetic, Relational, Logical, incremental and decremental operators, conditional operator, bitwise operators, Additional operators, Mixed mode operation and automatic (implicit) conversions, Cast or explicit conversion, operator precedence and associativity, structure of C program.

**Input/Output Functions and statements:**

Formatted input/output functions, scanf(), printf(), Escape sequences, Assignment statement, multiple assignment statement, writing user friendly programs, running a program using Turbo C, Commonly used turbo editing commands/key controls, more about formatted output functions, character input/output functions, getchar() function, putchar() function, getch() function, putch() function, getche() function, gets() function, puts() function, clrscr() function.

**Section II****Control Statement and arrays in C****Control statements in C:**

If-else statement, nested if-else statement, switch statement.

**Loop controls structures in C:**

loop control statements, for statement or for loop, nested for statement or nested for loop, while statement or while loop, do-while statement or do-while loop, comparison of loop control structures, goto statement, break statement, continue statement, exit() function.

**Arrays and subscripted values:**

one dimensional array, two dimensional array, Array declaration, accessing values in an array, initializing values in an array.

**String Manipulation in C:**

String handling functions in C, strlen() function, strcpy() function, strcat() function, strcmp() function, reading/writing strings, atoi() function, additional string handling functions, operations with characters

**Section III****Functions, Structures and pointers in C****Functions in C:**

uses of functions, user defined functions, function declarations, calling a function, actual and formal arguments, Rules to call a function, function prototype, recursion, Local or internal variables, Global or external variables, void function, storage classes in C, auto or automatic storage class, static storage class, extern storage class, register storage class.

**Structures and unions:**

structures, structure variables and arrays, initialization of structure variables and arrays, dot(.) operator, assigning values of a structure to another structure, structure as a function argument, structure within structure, sizeof() of a structure, unions, sizeof() of a union, difference between a structure and a union, enum data type, Bit field, typedef declaration.

**Pointers:**

pointer declaration, address operator &, indirection operation \*, expressions using pointers, pointers as function arguments, call by value, call by reference, comparison between call by value and call by reference, pointer arithmetic, pointers with arrays, reading/writing values in a n array using pointer, dynamic memory allocation, malloc() function, calloc() function, realloc() function, free() function, dynamic memory allocation

for an array, one dimensional array and pointer, multi dimensional array and pointer, pointers with strings, pointers with structures, pointers to functions, advantages of pointers.

**BSIT(05) -103 OPERATING SYSTEM**

**INSTRUCTIONS FOR PAPER-SETTER**

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each section and Part B will carry 4 questions from each section.

**INSTRUCTION FOR CANDIDATES**

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

**Section I**

**INTRODUCTION :-**

Overview of Operating System, Computer Hardware & OS Interaction, Components, Functions, Classification, Architecture and Design of OS, Monolithic and Layered Architecture, Virtual Machine and Exokernel architecture, Client Server Architecture, Interface design and Implementation, Performance Measurement and Monitoring.

**OVERVIEW OF PROCESSES AND THREADS :-**

Process States, Process State Transitions, PCB(Process Control Block), OS Services for process control, Cooperating processes and interprocess communication, Direct & Indirect Communication, CPU Scheduling, Types of Schedulers, Scheduling(FCFS, SJF, Priority, Round Robin, Multilevel, Multilevel Feedback Queue), Threads (Concept and Overview), User and Kernel Threads.

**SECTION II**

**PROCESS SYNCHRONIZATION :-**

Overview, Concept of Race Conditions, Critical Section Problem, Mutual Exclusion Principle, Synchronization Tools, Mutex, Semaphores, Monitors, Synchronization Problems, Bounded Buffer Problem, Readers and Writers Problem, Dining Philosopher Problem, Sleeping Barber Problem.

**DEADLOCK: -**

Deadlock Concepts, Conditions, Resource Allocation Graph, Deadlock Management, Prevention, Avoidance, Detection and Recovery.

**OVERVIEW OF MEMORY MANAGEMENT :-**

Basic concept of Memory, Address Binding, Logical and Physical Address Space, Memory Partitioning and Allocation, Protection, Fragmentation and Compaction, Swapping, Using Bitmaps and Linked Lists, Paging, Mapping of Pages to frames.

Hierarchical Page Tables, Segmentation, Accessing addresses in Segmentation, Segmentation with Paging.

### SECTION – III

#### **VIRTUAL MEMORY :-**

Basic Concept of Virtual Memory, Demand Paging, Thrashing, Transaction Lookaside Buffers, Inverted Page Tables, Algorithms ( Page Replacement, FIFO , Optimal Page Replacement , LRU, Clock, Counting based )

#### **OVERVIEW OF I/O SUBSYSTEM: -**

Basics of Input/Output System, I/O Hardware, Polling, Interrupts, DMA (Direct Memory Access), I/I System Function, Application I/O Interface, Kernel I/O Subsystem.

#### **FILE SYSTEM :-**

Introduction to File Systems, File Attributes and Naming, Data and Record Structure, File Organization, File Operations, Directory Structures, Single-Level structure, Two-Level Structure, Hierarchical Structure, Various File Systems , CD ROM, FAT 16, FAT 32, UNIX.

BSIT(05)-104	RDBMS-I
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### INSTRUCTIONS FOR PAPER-SETTER

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The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each section and Part B will carry 4 questions from each section.

### INSTRUCTION FOR CANDIDATES

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

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#### **Section I**

##### **Introduction to Databases, DBMS and RDBMS :**

Introduction, Information, Quality of Information, Information Processing, What is a Database?, Why a Database?, Characteristics of Data in a Database, What is a Database Management System (DBMS)?, Need for DBMS, Types of DBMS, Relational Database Management Systems (RDBMS), RDBMS Terminology, Relational Data Structure, Relational Data Integrity, Conclusion, Review Questions.

#### **Section II**

##### **Access 2000 Basics :**

Introduction, Starting Access 2000, Access Startup Dialog Box, Menus and Toolbars, Using Toolbar Buttons, Arranging Buttons on the Toolbar, Viewing Data, Creating an Access 2000 Database and Tables, Database Properties, Modifying Tables, Creating Forms, Entering and Updating Data Using Forms, Navigating between Records in a

Form, Finding, Editing and Deleting Data in a Form, Using Access 2000 Help, Using Answer Wizard, Using the Contents Tab to Get Help, Using the Index Tab to get Help, Exercises.

**Report and Queries:**

Introduction, Sorting and Filtering Records, Creating and Printing Reports, Creating and Using Queries.

**Section III**

**Introduction to Structured Query Language (SQL):**

Introduction, Characteristics of SQL, Advantages of SQL, Types of SQL Tables, Create Table, NULLS, Data Manipulation, Update Operations, SQL in Access.

**Query by Example (QBE):**

Introduction, SELECT Queries in QBE, Make-Table Query, DELETE Query, UPDATE Query, APPEND Query, Conclusion, Exercises.

**BSIT(05)-106 COMMUNICATION & SOFT SKILLS**

**Essentials of Grammar:** Parts of Speech, Punctuation, Vocabulary Building, Phonetics

**Office Management :** Types of Correspondence, Receipt and Dispatch of Mail, Filing Systems, Classification of Mail. ,Role & Function of Correspondence, MIS, Managing Computer

**Letter & Resume Writing:** Types of Letters-Formal / Informal, Importance and Function, Drafting the Applications, Elements of Structure, Preparing the Resume, Do's & Don'ts of Resume, Helpful Hints

**Presentation Skills:** Importance of Presentation Skills, Capturing Data, Voice & Picture Integration, Guidelines to make Presentation Interesting, Body Language, Voice Modulation, Audience Awareness, Presentation Plan, Visual Aids, Forms of Layout, Styles of Presentation.

**Interview Preparation:** Types of Interview, Preparing for the Interviews, Attending the Interview, Interview Process, Employers Expectations, General Etiquette, Dressing Sense, Postures & Gestures

**Group Discussion & Presentation:** Definition, Process, Guidelines, Helpful Expressions, Evaluation



(Note: Every student shall be given 15 minutes. of presentation time & 45 minutes of discussion on his/ her presentation.)

**The student will be evaluated on the basis of :**

- his / her presentation style
- Feedback of Faculty & Students
- General Etiquette
- Proficiency in Letter Drafting / Interview Preparation

  
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- The paper is internal and at least 3 tests will be taken. Best 2 of 3 shall account for final grades (70% Test & 30% Presentation)

  
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### INSTRUCTIONS FOR PAPER-SETTER

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### INSTRUCTION FOR CANDIDATES

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

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#### Section -I

##### Number System And Codes:

Introduction, Number System (Binary Numbers, decimal-binary conversion, Octal Numbers, Octal-Binary Conversions, Hexadecimal Numbers, Hexadecimal-Binary conversions, Hexadecimal-octal conversions), Floating Point Representations of Numbers, Arithmetic Operations (Binary Arithmetic), 1's and 2's Complement (1's Complement Subtraction, 2's Complement Subtraction, Signed Binary number Representations, Addition in the 2's complement System, Subtraction in the 2's complement system;

##### Boolean Algebra:

Basic Laws of Boolean algebra (Boolean addition, Boolean Multiplication, Properties of Boolean Algebra, Demorgan theorems, Sum of Products and Product of Sums, (Minterm, Maxterm, Deriving Sum of Products(SOP) Expression from Truth Table, Deriving Product of Sum(POS) Expression from Truth Table, Karnaugh Map (Two variable, Three variable).

#### Section II

##### Logic gates:

Logic gates (OR Gate, AND Gate, NOT Gate, NAND Gate, NOR Gate, Ex-OR Gate, Ex-NOR Gate).

##### Arithmetic Circuits:

Half Adder, Full Adder, Half-Subtractor, Full Subtractor, Combinational Circuits: Multiplexers, Basic four input multiplexer, Demultiplexers, 1 to 4 demultiplexer, Decoders, Basic Binary decoder, 3 to 8 decoder, Encoders : Decimal to Binary Encoder.

#### Section -III

##### Flip Flops:

Introduction, Flip Flops, Types of Flip-Flops, S-R Flip-Flop (NOR Based, NAND Based), Clocked S-R Flip-Flop, D Flip-Flop, J-K Flip-Flop

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**Memories:**

Introduction, Classification of memories, Registers, Main Memories and Secondary Memory, Sequential Access Memory And Random Access Memory, Static and Dynamic Memory, Volatile and Non Volatile Memory, Magnetic and Semiconductor Memory, Basic Memory Structure.

**BSIT(05)-202 DATA STRUCTURES****INSTRUCTIONS FOR PAPER-SETTER**

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The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each section and Part B will carry 4 questions from each section.

**INSTRUCTION FOR CANDIDATES**

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

**Section -I****Arrays, Pointers & Structures:**

What is Array, Declaration of Array, Processing with Array, Initialization of Array, Use of Array in Function, Multidimensional Array, What is Pointer, Declaration of pointer, Pointers and functions, (call by value, call by reference) Array of Pointers, Dynamic memory allocation, What is structure, Array of Structures

**Linked List:**

Introduction, Traversing a linked list, Searching a linked list, Insertion in a linked list, Deletion from a linked list, Reverse linked list, Circular linked list-creation of circular linked list, traversing circular linked list, insertion in circular linked list, deletion in circular linked list. Double linked list- creation of doubly linked list

**Section II****Stacks and Queues:**

Introduction to Stacks, Array implementation of Stack (push operation on Stack, pop operation on Stack), Linked Implementation (Push operations on Stack, Pop operations on Stack), Applications of Stack-Reversal of String, Checking validity of an expression containing nested parenthesis.

Queues –Array implementation of Queue (Add operations in Queue, Delete operation in Queue) Linked List Implementation (Add operations in queue, delete operation in queue) Circular Queue (Add operation in circular queue, Delete operation in Queue) Priority Queue-linked implementation of priority queue, Operations in priority queue (Add operations in priority queue, Delete operation in priority queue, Dequeue- Array implementation of Dequeue, Add and Delete operations in dequeue

### **Section -III**

#### **Trees:**

Introduction, Binary tree, Strictly Binary tree, Complete Binary tree, Extended binary tree, Algebraic expression representation in tree, Representation of Binary tree- Linked representation, Traversing in Binary tree (Preorder, Inorder, Postorder), Binary Search Tree (Search And Insertion Operations, Deletion Operations), Traversing in Binary Search trees (Preorder, Postorder, Inorder) Recursive Functions for finding a node in Binary search tree

#### **Sorting:**

What is Sorting, Efficiency parameters, efficiency of sorting, Bubble Sort- Analysis, Selection sort-Analysis, Insertion sort- Analysis, Quick Sort-Analysis.

Searching: What is searching, Linear search, Binary search, Comparison of Linear and Binary search.

<b>BSIT(05)-203</b>	<b>WEB TECHNOLOGIES</b>
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### **INSTRUCTIONS FOR PAPER-SETTER**

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### **INSTRUCTION FOR CANDIDATES**

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

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### **Section -I**

#### **INTRODUCTION TO THE INTERNET:**

Computers in Business, Networking, Internet E-mail, Resource Sharing, Gopher, World Wide Web, Usenet, Telnet, Bulletin Board Service, Wide Area Information Services.

#### **INTERNET TECHNOLOGIES:**

Modem, Internet Addressing, Physical Connections, Telephone Lines. INTERNET BROWSERS (Internet Explorer, Netscape Navigator)

#### **INTRODUCTION TO HTML:**

Designing a Home Page, History of HTML, HTML Generations, HTML Documents, Anchor Tag, Hyper Links,

#### **HEAD AND BODY SECTIONS:**

Header Section, Title, Prologue, Links, Colorful Web Page, Comment Lines

#### **DESIGNING THE BODY SECTION:**

Heading Printing, Aligning the Headings, Horizontal Rule, Paragraph, Tab Setting, Images and Pictures, Embedding PNG format images.

## SECTION II

### ORDERED AND UNORDERED LISTS:

Lists, Unordered Lists, Headings in a List, Ordered Lists, Nested Lists.

### TABLE HEADLING:

Tables, Table creation in HTML, Width of the Table and cells, cells spanning multiple row/columns, coloring cells, column specification,

### DHTML AND STYLE SHEETS:

Defining styles, Elements of styles, linking a style sheet to an HTML Documents, In-Line Styles, External style sheets, Internal style sheets, Multiple Styles.

## SECTION III

### FRAMES:

Frameset Definition, Frame Definition, Nested Framesets etc.

### A WEB PAGE DESIGN PROJECT:

Frameset Definition, Animals, Birds, Fish.

### FORMS:

Action Attributes, Method Attribute, Encrypt Attribute, Drop Down List, Sample Forms.

**BSIT(05)-204 DESKTOP PUBLISHING TOOLS**

## INSTRUCTIONS FOR PAPER-SETTER

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The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each section and Part B will carry 4 questions from each section.

## INSTRUCTION FOR CANDIDATES

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### Section I

**CorelDraw Basics** : Introduction; CorelDraw Terminology; Starting CorelDraw 10; CorelDraw Interface; Title Bar; Menu Bar; Tool Box; Drawing Window; Drawing Page; Property Bar; Flyouts; Standard Toolbar; Controlling the display of Toolbars; Working with Docker Windows; The Status Bar; CorelDraw View; Zooming and Planning.

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**Basic Drawing** : Introduction; Working with Lines; Drawing a Curve; Bezier Lines and Curves; Rectangles and Squares; Ellipses and Circles; Polygons and Stars; Selection Techniques; Using Rulers; Using Grids and Guidelines; Defining Grids; Snap to Grid; Defining Guidelines; Snap to Guidelines; Spirals and Graphs; Spirals; Graphs.

**The Artistic Media Tool** : Introduction; Using Preset Tool; Using Brush Tool; Using Object Sprayer Tool; Using Calligraphic Tool; Pressure-Sensitive Lines or Curves; Applying Artistic Media Effects.

**Advanced Drawing** : Introduction; Grouping and Ungrouping Objects; Working with Layers; Object Locking; Editing Curves with nodes; Editing Shapes and Nodes; Using Knife Tool; Using the Eraser Tool; Using Free Transform Tool.

**Working with Text** : Creating Artistic Text in Paragraphs; When to use Artistic Text?; Working with Artistic Text; Creating Artistic Text; When to use Paragraph Text?; Creating Paragraph Text; Switching between Artistic and Paragraph Text; The Text Property Bar; Formatting Text; Format Text Dialog Box; Character Formatting; Paragraph Formatting; Setting Tabs; Setting Columns; Using Effects; Using Edit Text Feature; Using Find and Replace; Change Case; Using Spell-Check; Grammar Checking Text; Using Thesaurus.

**Advanced Text Work**: Fitting Text to Path; Flowing Text around an Object; Flowing Text within an Object; Editing individual Characters; Kerning Individual Characters; Working with Text Styles; Linking Frames.

**The Outline Tool** : Introduction; Using the Outline Pen Dialog Box; Setting Outline; Outline Styles; Outline Color; Outline Corners; Setting Outline Arrows; Applying Calligraphic Outlines; Setting Outline Options with the Property Bar; Behind Fill Option; Scale with Image Option; Outline Color Dialog Tool; Color Model; Color Harmonies; Color Blend; Setting Outline Defaults.

**The Fill Tool** : Introduction; Using Uniform Fills; Using Fountain Fills; Using Texture Fills; Using PostScript Fills; Using Pattern Fills; Using Mesh Fills; Using Interactive Fills; Copying Fills; Setting Fill Defaults.

**The Interactive Tools** : Introduction; Distorting Objects; Push and Pull Distortion; Zipper Distortion; Twister Distortion; Extruding Objects; Blending Objects; Interactive Envelopes; Free Transformations; Applying Interactive Shadow; Applying Interactive Transparency; Applying Interactive Contours.

## Section II

**Working with Images**: Introduction; Image Formats; Importing Images; Using the Scrapbook; Bitmap Images; Cropping Bitmaps; Bitmap Special Effects; Color Masking; Resizing & Rotating/Skewing Images; Exporting Images.

**Page Layout** : Introduction; Layout Styles; Define Page Size; Setting the Size; Inserting Pages; Specifying Background Color; Hiding the Page Border; Going to specific Pages.

**Printing and Publishing** : Introduction; Selecting a Printer; Using Layout Styles when Printing; Tiling a Print Job; Using Print Style; Print to File.

### Introduction to Photoshop

What is Photoshop?; New Features of Photoshop 2004 CS; Enhanced File Browser; Easily customize your keyboard shortcuts; Quickly create, view, and edit custom file information; Create slide shows and PDF presentations; Collaborate with Web photo galleries; Track your

editing history; Easily access and use multiple filters; Use enhanced scripting; Customize the Help menu; How to Create Web Images; How to Customize and Automate; How to Fix and Enhance Photos; How to Paint and Draw; How to Prepare Art for Other Applications; How to Print Photos; How to work with Color; How to Work with Layers and Selections; How to Work with Type;

#### **Tools of Photoshop**

Using Tools; Marquees Tool; Lasso Tool; Cropping Tool; The Airbrush Tool; Clone Stamp Tool; Eraser Tools; Blur and Sharpen Tool; Path Component Selection Tool; Pen Tool; Notes Tool; Hand Tool; Move Tool; Magic Wand Tool; Slice Tool; Paintbrush Tool; History Brush Tool; Paint Bucket Tool; Dodge Tool; Type Tool; Rectangular Tool; Eyedropper Tool Zoom Tool; Healing Brush Tool;

#### **Paints and Colors in Photoshop**

Use of Paints; Color Tools; Color Picker; the Color Palette; the Swatches Palette; Adding New Color; Saving Foreground as a Swatch; Blending Modes; Normal; Dissolve; Multiply; Behind; Screen; Overlay; Hard light; Soft light; Darken; Color Dodge; Color Burn; Lighten; Exclusion; Difference; Hue; Saturation; Color; Luminosity; Smudges; Focus Tools; The Toning Tools; Dodge and Burn Tools; Sponge Tools; Different Media; Watercolor; Oil Painting; Pencil Filters; Chalk and Charcoal Filters; Working with Colors; RGB Model; CYMK Model; HSB Model; CIE Lab; Working Models; Bitmap and Grayscale Mode; Indexed Colors

### **Section III**

#### **Text, Layers and Masks in Photoshop**

Adding Text to Images; Layer Effect; Glows Effect; Bevel and Emboss; Using Layers and Masks; Layers; Creating a New Layer; Hiding and Showing of Layers; Working with Multiple Layers; Merging Layers; Layer Effects; Masks; Quick Mask; Adding Mask to the Layer; Editing Layer Masks; Removing Layer Mask

#### **Special Effects in Photoshop**

Applying a Radial Blur; Adding Noise Texture; Creating Halftone Pattern; Blending Modes; Applying Ripple Effect; Creating Lightening Effects

#### **Menu Commands of Photoshop**

Introduction; File Menu; Edit Menu; Image Menu; Layer Menu; Select Menu; Filter Menu; View Menu; Window Menu; Help Menu

#### **Keyboard Shortcuts of Photoshop**

Viewing; Selecting and Moving Objects; Painting; Editing; Path editing; Slicing and Optimizing

  
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**INSTRUCTIONS FOR PAPER-SETTER**

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**INSTRUCTION FOR CANDIDATES**

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

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**Section I**

**Introduction to Digital Computer :**

Introduction; Evolution of Computers (Abacus (5000 B.C.), Pascal and Leibniz Calculators, Babbage Difference Engine, Difference/Analytical Engine, Herman Hollerith Punch Cards, Howard Aiken (1937):IBM Mk1, ENIAC (1946), UNIVAC-1(1951), Second Generation (1959-65), Third Generation (1965-70), Fourth Generation (since 1970), Fifth Generation (under development)).

**Basic Computer Design :**

Introduction; Computer Registers (General Purpose Registers, Accumulator, Status Register, Program Counter, Stack Pointer (SP), Word Size and Register Size); Main Memory; Interfacing Various Registers (Data Movement among Registers, Selection Control Variables); Computer Instructions (Direct Addressing Mode, Memory Reference Instructions, Register Reference Instructions, Input and Output Instructions); Timing Signals; Timing and Control (Sequence Counter, Control Logic Gates for Inputs/Outputs, Timings, How Fetch Cycle Works?, How Execution Cycle Works?, How an Instruction is Executed?); Microoperations ( Memory Reference Instructions, Register-Reference Instructions); Concept of Interrupt (Interrupt Cycle); Design of a Basic Computer and its Working (Control of Registers, Control of Memory, Control of Common Bus, Control of Flip-flops).

**Section II**

**Central Processing Unit (CPU) Organization :** Introduction; Addressing Modes; Instruction Formats (Instruction Types); Stack Organized CPU (How POP and PUSH functions are performed in Stack?, Reverse Polish Notation or Postfix Notation, How to convert Infix Expression into Postfix Expression?); What are the factors affecting instruction Length?; Program Control (External interrupts, Internal Interrupts, Software interrupts); General Register Organization; Arithmetic Logic Unit (Status Register, Design of Accumulator Logic Unit).

**Section III**

**Input-Output Organization :** Introduction; Peripheral Devices (Input Devices, Output Devices); Synchronous and Asynchronous Communications; I/O (Input/Output) Interface (Parallel and Serial Ports); Modes of Data Transfer (Programmed I/O, Interrupt-initiated

I/O, Polling, Direct Memory Access (DMA)); Interrupt (Software Interrupt, Hardware Interrupt); Priority Interrupt (Vectored Interrupt, Non-vectored Interrupt, Priority Interrupt, Daisy Chain); I/O Processor; DMA (Data Transfer through DMA, DMA controller).

**Memory Organization** : Introduction; Memory Hierarchy (Why Hierarchical memory system?); Main Memory or Primary Memory (RAM, ROM, Memory Unit, Design of Main Memory); Auxiliary Memory (Magnetic Tape, Magnetic Disk); Cache Memory (Locality of Reference, Hit Ratio, Mapping Process, How to Write Data into Cache Memory?); Virtual Memory (Paging, Page Replacement); Memory Management Hardware (Segmentation, How Multiprogram Management is done?, Memory Protection); Associative Memory.

**BSIT(05)-302 PRINCIPLES OF MANAGEMENT**

**INSTRUCTIONS FOR PAPER-SETTER**

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**INSTRUCTION FOR CANDIDATES**

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**Section I**

**Introduction:**

Objectives of Business, Essentials of Good Business, Concepts of Management, Management and Administration, Modern Manager, Science Theory and Practice of Management, Why study Management Theory; Managerial Objectives; Managerial Roles, Social Responsibility, Development of Management Thought, Approaches to the Study of Management, Business Environment, Social Attitudes, Beliefs and values

**Planning:**

Characteristics of Planning, Nature of Planning, Importance of Planning, Types of Plans, Steps in Planning, Limitations of Planning, Planning premises, Corporate Planning, Strategic Planning, Vision, Mission and Purpose

**Organizing:**

Organizing Theory, Principles of Organizing, Types of Organizations, Departmentation, Centralization and Decentralization, Authority and Responsibility, Mistakes in Organization

**Section II**

**Staffing:**

Personnel management, Systems Approach to Staffing, Establishment of organizational Structure, Recruitment and Selection, Industrial Law, Concept of Human Resource Development, Designing an Integrated HRD System, Grievance, Organizational Conflicts, Conflict Management, Areas of Conflict, Worker's Participation in Management

**Directing:**

Supervision and Leadership, Morale, Managerial Grid, Tri-dimensional Grid, Communication, Motivation, Need Theories

**Controlling:**

Controlling and Planning, Control Process, Types of Controls, Controls at organizational Levels, Information and control, Anticipatory controlling, Major guidelines to effective Controlling, Management Audit, Areas for overall controlling, Principles of Preventive Control

**Section III**

**Decision Making:**

Definition, characteristics of Decision Making, Nature of Decision Making, Decision Making Process, Techniques of Decision Making, Classification of Decisions, Evaluating the alternatives, Difficulties in Decision Making.  
Productivity and operations Management: Productivity, Operations Management, Production Planning and Control.

**Information Technology and Management:**

Emerging E-business, Information Technology (IT), Management Information System, Types of Information Systems

**BSIT(05)-303 Programming in C++**

**INSTRUCTIONS FOR PAPER-SETTER**

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**INSTRUCTION FOR CANDIDATES**

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**Section I**

**Principles of Object-Oriented Programming:**

Software Crisis; Software Evolution; A Look at Procedure-Oriented Programming; Object Oriented Programming Paradigm; Basic Concepts of Object-Oriented Programming; Benefits of OOP; Object Oriented Languages; Applications of OOP.

**Beginning with C++ :**

What is C++?, Applications of C++, A Simple C++ Program, More C++ Statements, An Example with Class; Structure of C++ Program, Creating the Source File, Compiling and Linking.

**Tokens, Expressions and Control Structures:**

  
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Introduction; Tokens; Keywords; Identifiers; Basic Data Types; User-Defined Data Types; Derived Data Types; Symbolic Constants; Type Compatibility; Declaration of Variables; Dynamic Initialization of Variables; Reference Variables; Operators in C++; Scope Resolution Operator; Member Dereferencing Operators; Memory Management Operators; Manipulators; Type Case Operator; Expressions and Implicit Conversions; Operator Overloading; Operator Precedence; Control Structures.

#### **Functions in C++ :**

Introduction; The Main Function; Function Prototyping; Call by Reference; Inline Functions; Default Arguments; const Arguments; Function Overloading; Friend and Virtual Functions.

### **Section II**

#### **Classes and Objects:**

Introduction; C Structures Revisited; Specifying a Class; Defining Member Functions; A C++ Program with Class; Making an Outside Function Inline; Nesting of Member Functions; Private Member Functions; Arrays Within a Class; Memory Allocation for Objects; Static Data Members; Static Member Functions; Arrays of Objects; Objects as Function Arguments; Friendly Functions; Returning Objects; const Member Functions; Pointers to Members.

#### **Constructors and Destructors:**

Introduction; Constructors; Parameterized Constructors; Multiple Constructors in a Class; Constructors with Default Arguments; Dynamic Initialization of Objects; Copy Constructor; Dynamic Constructors; Constructing Two-Dimensional Arrays; Destructors.

#### **Operator Overloading and Type Conversions :**

Introduction; Defining Operator Overloading; Overloading Unary Operators; Overloading Binary Operators; Overloading Binary Operators Using Friends; Manipulation of Strings Using Operators; Rules for Overloading Operators; Type Conversions.

#### **Inheritance Extending Classes :**

Introduction; Defining Derived Classes; Single Inheritance; Making a Private Member Inheritable; Multilevel Inheritance; Multiple Inheritance; Hierarchical Inheritance; Hybrid Inheritance; Virtual Base Classes; Abstract Classes; Constructors in Derived Classes;

#### **Member Classes :**

Nesting of Classes, Pointers,

#### **Virtual Functions and Polymorphism:**

Introduction; Pointers to Objects; this Pointer; Pointers to Derived Classes; Virtual Functions; Pure Virtual Functions.

### **Section III**

#### **Managing Console I/O Operations:**

Introduction; C++ Streams; C++ Stream Classes; Unformatted I/O Operations; Formatted Console I/O Operations; Managing Output with Manipulators.

#### **Working with Files:**

Introduction; Classes for File Stream Operations; Opening and Closing a File; Detecting End-of-File; More About Open() : File Modes; File Pointers and Their Manipulations; Sequential Input and Output Operations; Updating a File : Random Access; Error Handling During File Operations; Command-Line Arguments.

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**INSTRUCTION FOR CANDIDATES**

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**Section I**

**Introducing Relational Databases and Microsoft SQL SERVER 2000**

The history of SQL SERVER; What is a database; Relational Database objects ; Designing Relational Databases; Organizing the objects; Normalizing the data; Creating the databases and Tables; SQL SERVER and the Client/Server Model

**Data Types and Creating Tables**

Tables; Columns; SQL SERVER identifiers; Data Types; Nullability; Collate; Strings; Binary Data; Integers; Special Data Types; Date and Time data types; Money; Creating user defined data types; Working computed columns; Creating Tables; Using CREATE TABLE Statement; Creating tables with SQL SERVER Enterprise Manager;

**Retrieving Data with SELECT Statement**

Writing Simple SELECT Statements; Changing of COLUMN Headings; Manipulating Data; Arithmetic Operators; Mathematical Functions; String Functions; Date Functions; Data Conversion; Comparison Operators; ranges; Lists; Using Multiple Criteria to Retrieve Rows; Eliminating duplicate Information;

**Sorting of Data**

Sorting data using the ORDER BY Clause; Aggregate Functions; GROUP BY and HAVING ; COMPUTE and COMPUTE BY;

**Section II**

**Data Correlation & Subqueries**

Implementing Joins; Inner Joins; Natural Joins; Cross or Unrestricted Joins; Outer Joins; Working with Subqueries; Types of Subqueries; Correlated Subqueries; SELECT into ; UNION Operator;

**Modifying Data:**

Inserting Data ;Using the INSERT VALUES statement; Default Values; Inserting Data Using SELECT ;Deleting Data; Updating Data;

**Using Transact –SQL**

Control-of Flow Language Elements; BEGIN...END block; print Statement; IF ... ELSE Block; Case Expressions; Using the while Command

#### **Data Integrity**

Types of Integrity; Domain Integrity; Referenced Integrity; Entity Integrity; User defined data types; Rules; Ensuring Data Accuracy with SQL Server Enterprise Manager; Deffering Constraints; Disabling Constraints

#### **Creating Views**

Creating and Manipulating Views; creating Views; Types of Views; Modifying Data in Views; Altering Views; Removing Views;

### **Section III**

#### **Stored Procedures and Functions**

Working with Stored Procedures ; Creating Stored Procedures ; Gathering Information on Stored Procedures; Using Parameters with Stored Procedures; Working with User defined Functions; Scalar functions; Inline table Valued Functions; Multistatement Table Valued Functions

#### **Triggers**

Creating Triggers with CREATE TRIGGER Statement; Enforcing Data Integrity with Triggers; Using INSTEAD OF Triggers

#### **Creating Users and Logins**

SQL Server Security Access Model ; Windows Authentication; SQL Server Login creation; Creating Database users

#### **Permissions**

Implementing Database Permissions; Types of Permissions; Permissions Precedence;

**Statement Permissions:** The CREATE DATABASE Permission; The CREATE TABLE;VIEW;FUNCTION; PROCEDURE;DEFAULT and RULE Permission;

**Object Permissions :** Assigning Object Permissions; Permissions on Views; Stored Procedures; and Functions;

BSIT(05)-401 VISUAL BASIC

#### **INSTRUCTIONS FOR PAPER-SETTER**

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#### **INSTRUCTION FOR CANDIDATES**

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## Section I

### Introduction to Visual Basic (VB) :

What is Visual basic; Features of Visual Basic; Visual basic Editions; The Visual Basic Philosophy; The Controls; The Properties; Events; Methods; Developing an Application; Design the User Interface; Write Code to Respond to User Input/Events

### Creating an Application :

Objectives ; The Tool Box; Project Explorer; The Properties Window; The Form Window; Saving the Project; Understanding Projects; What does Visual Basic 6 have for you to create applications; Customizing this Toolbar; What is on the Toolbar; Text Box Control; The Picture Box; Label Box; Option Button; Frame; List Box; Combo Box; Data; Command Button; Check Box; The Drive, Directory and File List Controls; The Line and Shape Controls; The Image Control; OLE(Object Linking and Embedding); Other Tools for Software Development; Menu Bar; Context Menus; Tool Bars; Tool Box; Project Explorer Window; Properties Window; Object Browser; Form Designer; Code Editor Window; Form Layout Window; Immediate, Locals, and Watch Windows

### IDE, Forms and Controls :

Objectives; The Form; The Anatomy of a Form; Setting Form Properties; Working with the Properties Window; Name; Caption; Picture; Background Color; The Control Box; Min Button and Max Button; Movable; Border Style; Font Properties; Form Methods; Move; Graphic Methods; Show Methods; Initialize; Load; Activate; Deactivate; Unload Event; Terminate; Show Method; Show Style; Hide Method; How Do You Put or Create the Control on the Form; Working with a Control; More work on a Control; The Code Window; Opening the Code Window; Anatomy of the Code Window; Now Entering the Code,

## Section II

### Variables in Visual Basic :

Objectives; What is a Variable; Declaring variables; Data Types; The Null Value; The error Value; The Empty Value; The Scope of a Variable; Module Level Variable; Declaring Variable; Constants; Circular References; Converting Data Types; Arrays, How do you Define them; Declaring Fixed-Size Arrays; Multi-dimensional arrays; Dynamic arrays; The Preserve Keyword; More on ReDim

### Writing Code in Visual Basic :

Objectives; The Code Window; Opening the Code Window; Parts of the Code Window; Object Box; Procedures/Events Box; Split Bar; Margin Indicator Bar; Procedure View Icon; Full Module View Icon; The Procedure Separator; The Anatomy of a Procedure; Subroutine or Function; Editor Features; Automatic Word Completion; Auto List Members; Color Cueing; Line Continuation Character; Commenting and Uncomment Statements; The For. Next Statement; The Decision Maker. If; The Loop; The While Loop; Select Case...End Select

**Menus :** Objectives; The Road Ahead; Building the User Interface. The First Step; Overcrowding; Important Information Must be Given Prominence; Consistency; The Fonts; Consistency Across Forms and the Application; Affordances; Simplicity; Usability; Images; Colors; Interacting With the user; All about Menus; The Menu system; Menu Conventions; The Menu Editor; Using the Menu Editor; Making the Menu Better; Coding the Menu Items; Adding the Toolbar; Toolbar Conventions; Pasting Icons on Buttons

### Multiple Document Interface Applications :

Why MDI Forms; Features of an MDI Form; Loading MDI Forms and Child Forms; The Active Form Property; Changing the Caption of the New Forms; Listing Open Forms; Saving your work; Specifying the Active Child Form or Control; Maintaining State Information for a Child Form; Unloading MDI Forms with Query Unload

### Section III

#### **Additional Controls Available in Visual Basic 6.0 :**

Objectives; The Image List control; Working with the Image List Control; Adding Images to the Image List; Tab strip Control; Creating Tabs at Design Time or Run Time; Associating the Image List Control with the Tab Strip Control; MSFlexGrid Control; The Status Bar Control; The Panel Object and the Panels Collection; Tree View Control; Creating a Tree View control; Working with the Tree View control; Displaying Data from a Database; Populating the Tree View control; Slider Control;

#### **ActiveX Data Objects :**

Objectives; Why ADO; OLE DB; ADO; Establishing a Reference; The Data Source; The ODBC Data Source Administrator; Using the Data Source name in Our Control; Table or Stored Procedure; Using Bound Controls; Updating the data in the Data Source; What is a Cursor

#### **Crystal and Data Reports :**

Crystal Reports; Prerequisites for working with Crystal reports; Creating a Report through a Wizard; Creating a Report without a Wizard; The Design/Preview Window; Data Report; Getting acquainted with the Data Report Designer; Parts of the Data Report; Data Report Controls; Extracting the Data; Creating Multiple Reports

#### **Distributing your application :**

Objectives; Working with the packaging and Deployment Wizard

### **BSIT(05)-402 BASIC MATHEMATICS-I**

#### **INSTRUCTIONS FOR PAPER-SETTER**

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#### **INSTRUCTION FOR CANDIDATES**

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#### **Section I**

##### **Sets :**

Sets, Elements, Types of Sets, Operations with Sets, Union, Intersection, universal set, Complements, Algebra of sets, Venn diagrams, Applications of set theory. Logic Logic, Statement, Connectives, Equivalent statements, Connectives, Tautology and contradiction, Algebra of statements, Argument, Compound statements.

#### **Section II**

**Trigonometric Ratios :**

Definitions, Signs of Trigonometric ratios, Trigonometric ratios of some standard angles. Trigonometrically ratios of allied angles

**Matrices and Determinants :**

Definition of matrix, Different types of matrices, Algebra of matrices, Multiplication of Matrices, Transpose of a matrix, Inverse of a matrix, Determinants, Properties of determinants, Minors and co-factors, Cramer's rule for solution of linear equations.

**Section III****Progressions :**

Arithmetical progression, General term of a given AP, Sum of finite number of quantities in AP, Arithmetic means, To insert n arithmetic means between two given quantities, Geometrical progression, To find nth term of GP, To find the sum of first n terms of a GP, Geometric mean, To find n geometric means between two given numbers.

**Permutations and Combinations :**

Factorial notation, Fundamental principles of counting, Distinction between groups and arrangements, Number of permutations, permutations with repetitions, Circular permutations, Combinations, Taking some or all.

**BSIT(05)-403 | MICROPROCESSOR SYSTEM****INSTRUCTIONS FOR PAPER-SETTER**

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**INSTRUCTION FOR CANDIDATES**

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**Section I**

**MICROPROCESSOR ARCHITECTURE :** Introduction, Intel 8085, ALU, Timing and control unit, registers, data and address bus, Pin Configuration

**Section II**

**INSTRUCTIONS & FLAGS - INTEL 8085 :** Intel 8085 Instructions, Opcode and Operands, Instruction word size, Instruction and data formats, Addressing modes( Direct, Register, Register Indirect, immediate, implicit), Status flags, Symbols and Abbreviations

**Section III**

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**INSTRUCTION SET- INTEL 8085 :** Intel 8085 Instructions ( Data transfer group(Mov r,M, Mov M,r, MVI r,data, MVI M,data, LXI rp,data 16, LDA addr, STA addr, LHLD addr, SHLD addr ), Arithmetic group( ADD r, ADD M, DAD rp, SUB r, SUB M, INR r,INR M, DCR r, DCR M, INX rp, DAA), logical group( ANI data, CMP r, CMP M), branch group,( JNZ addr(label), JNC addr (label) ) stack, I/O and machine control group(HLT ))

**EXAMPLES OF ASSEMBLY LANGUAGE PROGRAMS:** Introduction, Simple Examples, Addition of two 8 bit numbers sum 8 bit, 8 bit subtraction, addition of two 8 bit numbers sum 16 bits or more, 8 bit decimal subtraction, one's complement of an 8 bit number and 16 bit number, 2's complement of 8 and 16 bit, shift an 8 bit and 16 bit left by one bits, larger of two numbers, largest number in a data array, square of a number.

BSIT(05)-404	WEB TECHNOLOGIES-II
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#### INSTRUCTIONS FOR PAPER-SETTER

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#### INSTRUCTION FOR CANDIDATES

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#### Section I

##### Getting Started with Active Server Pages:

What are Active Server Pages? (Understanding the Client Server Model, How ASP differs from Client-Side Scripting Technologies); Running ASP Pages (Setting Up Personal Web Server, Setting Up Internet Information Server, Using ASP without IIS or PWS); Creating Your First ASP Pages.

##### Dissecting Your First ASP Script:

Understanding ASP Scripts (What Does Response.Write Do?, The <%=Shortcut, What's with the <%@ LANGUAGE=VBSCRIPT%>?, Writing ASP Code Without Using <%...%>, Comments, Line Continuation Character); What Your ASP Script Returned to the Browser; The ASP Process

##### Working with Variables :

What is a Variable?, Data Types; Integer; Floating-Point Numbers (String, Date, Boolean, Currency, Object, What Are Variant Variables?. What Does It Mean to Declare a Variable?, Why Use Explicit Declarations in VBScript?, How Do You Name a Variable?, Constants, Arrays, How Do You Determine Your Variable's Type?); VB Script Operators (Assignment Operators, Mathematical Operators, Subtraction, Multiplication, Division, Integer Division, Modulus, Exponentiation, Negation Concatenation, Comparison Operators, Logical Operators).

#### Section II

**Understanding VBScript Control Structures :**

What Is a Control Structures; Types of Controls (Conditional Logic, Looping Logic, Branching Logic); Control Structure Examples (Conditional Logic Controls, Looping Logic Controls, Branching Logic Controls).

**Using VBScript's Built-In Functions :**

Typecasting Variables (What is Typecasting and Why Should I Typecast?, How to Typecast Your Variables); Formatting Functions; Math Functions; Date Functions (Working with Date Values, Breaking Down Date Values); String Functions; Other Functions.

**Working with Objects :**

What are objects?; The Building Blocks of Objects (Properties, Methods, Instances of Objects); Built-in ASP Objects (Response Objects, Request Object, Application Object, Session Object, Server Object, Object Context Object, ASP Error Object); Collections; Working with Objects; Events.

**Using the Response Object :**

What is the Response Object; Dissecting the Response Object (Sending HTML to the Browser, Buffering ASP Pages, Sending the User to Another Page, Cookies, Caching Your ASP Pages).

**Communicating with the User :**

Receiving Information from the User (What are Forms?, Creating Forms, Designing Forms, Submitting Forms, Reading Form Values from an ASP Page); Using Advanced Form Techniques (Revisiting the ACTION Property, Client-Side Form Validation); Using the Different Form Fields (Text Boxes, List Boxes, Check Boxes, Radio Buttons, Choosing your Checkboxes and Radio Buttons).

**Collecting the Form Information:**

Retrieving the Results of a Form (Using the Request Object); Using the Query string to Send Information,

**Working with the Request Object:**

Accessing the HTTP Headers (Useful HTTP Headers, Reading the HTTP Headers with Request. Server Variables); Accessing the Environment Variables (Useful Environment Variables, Reading the Environment Variables Using Request. Server Variables); Using Cookies (What are Cookies?, How to Read Cookies Using the Request Object, How to Write Cookies Using the Response Object, Advantages and Disadvantages of Using Cookies.

**Maintaining Persistent Information on the Web :**

It's a Fact: The Web Is Stateless (Ways to Maintain State); The Session Object (Using Session Variables, Pitfalls of Session Variables, Session Variables Without Cookies); The Application Object (Using Application Variables, Pitfalls of Application Variables); Initializing Application and Session Variables (Creating a Global. asa File).

**Debugging You ASP scripts and Handling Errors:**

Debugging Your ASP Scripts (Debugging Fatal Bugs, Debugging Nonfatal Bugs); Handling ASP Errors Gracefully (Using the Err Object, Using the ASP Error Object); Handling Non-ASP Errors Gracefully.

**Section III**

**Using Databases:**

What Are Relational Databases? (Common Relational Databases); Why Use Databases? Working with Databases Using ASP.

**Reading from a Database Using ASP :**

Databases and ASP (Communicating with a Database Using ActiveX Data Objects (ADO)); Connecting to a Database (The Connection Object, Using a System DSN, Using a DSN-less Connection, Opening the Connection, Closing the Connection, Properties of the Connection); Reading Data from a Database (The Recordset Object, Using adoovbs.inc, Reading and Displaying the Contents of a Database Table).

**Inserting, Updating, and Deleting Database Records :**

Inserting Records (Lock Types, AddNew and Update); Updating Records; Deleting Records.

**Examining the RecordSet Object :**

Enhancing Information Retrieval (Using the Fields Collection); Understanding the CursorType and CursorLocation Properties; Sorting Recordsets; Filtering Recordsets (Filtering Recordsets Bases on User Input).

**Using SQL Statements to Query Data:**

What is SQL? (Executing SQL Statements Using ASP and ADO); The SELECT SQL Statement (Using the WHERE Clause, Iterating Through Recordsets Generated by SQL Statements), Allowing Users to Query Data.

BSIT(05)-501 CORE JAVA PROGRAMMING

**INSTRUCTIONS FOR PAPER-SETTER**

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**INSTRUCTION FOR CANDIDATES**


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Section I

**FUNDAMENTALS OF OBJECT-ORIENTED PROGRAMMING:**

Introduction; Object-Oriented Paradigm; Basic Concepts of Object-Oriented Programming (Objects and Classes, Data abstraction and encapsulation, Inheritance, Polymorphism, Dynamic binding, Message communication); Benefits of OOP; Applications of OOP.

**JAVA EVOLUTION:**

  
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Java History; Java Features (Compiled and interpreted, Platform-independent and portable, Object-oriented, Robust and secure, Distributed, Simple, small and familiar, Multithreaded and interactive, High performance, Dynamic and extensible); How Java Differs from C and C++ (Java and C, Java and C++); Java and Internet, Java and World Wide Web, Web Browsers (Hot Java, Netscape Navigator, Internet Explorer); Hardware and Software Requirements; Java Support Systems, Java Environment (Java development kit, Java standard library).

#### **OVERVIEW OF JAVA LANGUAGE:**

Introduction; Simple Java Program (Class declaration, Opening brace, The main line, The output line); More of Java (Use of math functions, Comments); An application with Two Classes; Java Program Structure (Documentation section, Package statement, Import statements, Interface statements, Class definitions, Main method class); Java Tokens (Java character set, Keywords, Identifiers, Literals, Operators, Separators); Java Statements; Implementing a Java Program (Creating the program, Compiling the program, Running the program, Machine neutral); Java Virtual Machine; Command Line Arguments; Programming Style.

#### **CONSTANTS, VARIABLES AND DATA TYPES:**

Introduction; Constants (Integer constants, Real constants, Single character constants, String constants, Backslash character constants); Variables; Data Types (Integer types, Floating point type, Character type, Boolean type); Declaration of Variables; Giving Values to Variables (Assignment statement, Read statement); Scope of Variable; Symbolic Constants (Modifiability, Understandability); Type Casting (Automatic conversion); Getting Values of Variables; Standard Default Values.

#### **OPERATORS AND EXPRESSIONS:**

Introduction; Arithmetic Operators (Integer arithmetic, Real arithmetic, Mixed-mode arithmetic); Relational Operators; Logical Operators; Assignment Operators; Increment and Decrement Operators; Conditional Operators; Bit-wise Operators; Special Operators (instance of operator, Dot operator); Arithmetic Expressions; Evaluation of Expressions; Precedence of Arithmetic Operator; Type Conversions in Expressions (Automatic type conversion, Casting a value); Operator Precedence and Associativity; Mathematical Functions.

#### **Section II**

#### **DECISION MAKING AND BRANCHING :**

Introduction; Decision Making with if Statement; Simple if Statement; The if.....else Statement; Nesting of if.....else Statements; The else if Ladder; The switch statement; The ?: Operator.

#### **DECISION MAKING AND LOOPING :**

  
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Introduction; The while Statement; The do Statement; The for Statement (Additional features of for loop, Nesting of for loops); Jumps in Loops (Jumping out of a loop, Skipping a part of a loop); Labeled Loops.

### **CLASSES, OBJECTS AND METHODS :**

Introduction; Defining a Class; Adding Variables; Adding Variables; Adding Methods; Creating Objects; Accessing Class Members; Constructors; Methods Overloading; Static Members; Nesting of Methods; Inheritance: Extending a Class (Defining a subclass, Subclass constructor, Multilevel inheritance, Hierarchical inheritance); Overriding Methods; Final Variables and Methods; Final Classes; Finalizer Methods; Abstract Methods and Classes; Visibility Control (public access, friendly access, protected access, private access, private protected access, Rules of Thumb).

### **ARRAYS , STRINGS AND VECTORS :**

Arrays; One-Dimensional Arrays; Creating an Array (Declaration of arrays, Creation of arrays, Initialization of arrays, Array length); Two-Dimensional Arrays (Variable size arrays); Strings (String arrays, String methods, String Buffer class); Vectors; Wrapper Classes.

### **INTERFACES:**

Introduction; Defining Interfaces; Extending Interfaces; Implementing Interfaces; Accessing Interface Variables.

### **PACKAGES:**

Introduction; System Packages; Using System Packages; Naming Conventions; Creating Packages; Accessing a Package; Using a Package; Adding a Class to a Package; Hiding Classes.

### **Section III**

### **MANAGING ERRORS AND EXCEPTIONS:**

Introduction; Types of Errors (Compile-time error, Run-time error); Exceptions; Syntax of Exception Handling Code, Multiple Catch Statements; Using finally Statement; Throwing Our Own Exceptions; Using Exceptions for Debugging.

### **APPLET PROGRAMMING:**

Introduction; How Applets Differ from Applications; Preparing to Write Applets; Building Applet Code; Applet Life Cycle (Initialization state, Running State, Idle or stopped state, Dead state, Display state); Creating an Executable Applet; Designing a Web Page (Comment Section, Head Section, Body Section); Applet Tag; Adding Applet to HTML File; Running the Applet; More About Applet Tag; Passing Parameters to Applets; Aligning the Display; More about HTML Tags; Displaying Numerical Values; Getting Input from the User (Program analysis).

## GRAPHICS PROGRAMMING:

Introduction; The Graphics Class; Lines and Rectangles; Circles and Ellipses; Drawing Arcs; Drawing Polygons; Line Graphs; Using Control Loops in Applets; Drawing Bar Charts.

**BSIT(05)-502 WAP and WML**

## INSTRUCTIONS FOR PAPER-SETTER

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 5 questions from each section and Part B will carry 4 questions from each section.

## INSTRUCTION FOR CANDIDATES

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

### Section I

#### INTRODUCING WAP:

What is WAP, Importance & Benefits of WAP, History of WAP, WAP Architecture, WAP Services, Why WAP, and Future of WAP.

#### BASICS OF A GOOD WAP APPLICATION:

WAP Micro browsers, Generic WML Interface, Application design process, common design mistakes.

#### THE USER INTERFACE :

User interface basics, Low bandwidth, Small Screen size, Text Entry, Using the Cache, Types of WML cards, The Back button.

#### WAP DEVELOPMENT TOOLS & SOFTWARE :

Editors & emulators, Software Developer Kits and Integrated Development Environments, Converting Images, Specification of Well defined WBMP types.

### Section II

#### WORKING WITH WML :

ML Basics, WAP & the Web, writing WML code, The document prologue, the Deck header, The First Card, the Second Card, The Deck Footer, Using Multiple decks, Graphics, Crating Links, Templates.

#### INTERACTIVITY :

  
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FORMS & USER INPUT :- The Options Menu, Selection on the Nokia, Selection on Phone.com, Option Groups, Templates, the Do Element, Events, Orienterbackward, Orienterforward, Onpick, Ontimer, Variables, The Input Tag, Data Formatting.

**ADDING FUNCTIONALITY WITH WMLScript :**

What is WMLScript, The rules of WMLScript, Variables, Operators, Control Constructs, Reserve Words, Functions, The Standard Libraries, Arrays, Pragmas, General coding principles.

**Section III**

**DATABASE DRIVEN WAP :**

Active Server Pages, ASP & WAP, The ASP Object Model, Activex Objects, Physically Connecting To Database, Querying The Database, Using The Returned Data, Tidying Up.

BSIT(05)-503	COMPUTER NETWORKS
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**INSTRUCTIONS FOR PAPER-SETTER**

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**INSTRUCTION FOR CANDIDATES**

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

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**Section I**

**Basic Concepts**

Components of Data Communication, Distributed processing, Standards and Organisations, Line Configuration, Topology and Types of Topology, Transmission Mode, Categories of Networks.

**OSI and TCP/IP Models**

What is Protocol, OSI Model, Layers and their functions. Transport Protocol: Introduction to TCP/IP, Internet Protocol. Protocols forming part of IP, Internet Upper-Layer Protocols: FTP, TELNET. Comparison of different models (TCP/IP vs. OSI Model)

**Section II**

**Digital Transmission Interfaces and Modems :**

Types of Data: Digital Data, Analog Data., Data Transmission: Difference between digital data and analog data transmission, Digital to Analog conversion, Interfaces and Modems: DTE-DCE Interface. Modem. Analog Modem, Digital Modem, Asynchronous Modems, Cable Modem.

**Transmission Media :**

Noise absorption, Radiation, Attenuation, Bandwidth. Guided and Unguided media. Comparison of media

**Introduction to Signals :**

Analog and Digital Signals, Periodic and Aperiodic Signals, Time and Frequency domains. Composite signals.

**Section III**

**LANS and MANS :**

Local area network: Advantages, disadvantage, characteristics. Metropolitan area network. IEEE 802, Ethernet: Physical layer, Physical layer interface, Data link layer, system configurations, 10Base-5, 10Base-2, 10Base-T, Physical network topology used for Ethernet. Token passing Networks. Fiber distributed data interface for MANs. Switched multimegabit data services.

**Switching :**

What is switched network? Circuit Switching, Packet switching, Message switching

**Point to Point Protocols :**

What is remote access? RAS, Transmission states, Point to Point layers, Link control protocol, Authentication, Network control protocol.

**Reference Book :**

Computer Networks – Madhulika Jain, Vineeta Jain, Satish Jain (BPB Publications)

**BSIT(05)-504 MANAGEMENT INFORMATION SYSTEMS**

**INSTRUCTIONS FOR PAPER-SETTER**

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**INSTRUCTION FOR CANDIDATES**

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

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**Section I**

**Management Information Systems:**

an overview; information, data and communication; system concepts-structure and elements ;System concepts –objectives and types

**Section II**

**Organisations:**

scientific management and the classical school; Organisations- human relations school and the contingency approach; Management- introduction and functions; Leadership , Organising and coordinating

**Section III**

**Planning :**

Decision making, Elements of control; Control in organizations; Information technology and MIS; Influences on MIS Design

BSIT(05)-001	SOFTWARE ENGINEERING
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**INSTRUCTIONS FOR PAPER-SETTER**

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**INSTRUCTION FOR CANDIDATES**

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

**Section I**

**The Software Engineering Discipline :**

Evolution and impact

Evolution of an Art to an Engineering Discipline; a Solution to the Software Crisis? Programs Vs Software Engineering; Emergence of Software Engineering

**Software Life Cycles Models :**

Why use a Life Cycle Model; Classical Waterfall Model; Iterative waterfall Model; Prototyping Model; Evolutionary Model; Spiral Model;

**Software Project Management :**

Responsibilities of a Software Project Manager; Project Planning; Metrics for Project Size Estimation; Project Estimation Techniques; Cocomo Model; Halstead's Software science; Staffing Level Estimation; Scheduling; Organization and Team Structures; Staffing; Risk Management;

**Software Configuration Management :**

Requirement Analysis and specification

Requirements gathering and analysis; software Requirement specification; formal system development techniques; Axiomatic specification; Algebraic Specification; Algebraic Specification

**Section II**

**Software Design :**

  
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Classification of Cohesiveness; Classification of Coupling; Software design approaches; Function- Oriented Design; Object Oriented Design

**Function oriented Software Design :**

Structured Analysis; DFDs; primitive Symbols used for Constructing DFDS ; developing the DFD Model of a system; Short comings of the DFD Model; Extending DFD Technique to Real Time Systems; Structured Design; Detailed Design;

**Coding and Testing :**

Coding; Coding Review; Testing; Testing in the Large vs. Testing in the small; unit testing; black box Testing; white box testing; debugging; program analysis tools; integration testing; system testing;

**Section III**

**Software Reliability and Quality Management**

Software Reliability; Hardware Vs Software Reliability; Reliability Metrics; Reliability Growth Modelling ; Statistical Testing; Software Quality; Software Quality Management System; ISO 9000;

**Software Maintenance:**

Characteristics of Software Maintenance; Type of Software Maintenance; Characteristics of Software Evolution; Software Reverse Engineering; Software Maintenance Process Models; Estimation of Maintenance Cost

**Software Reuse:**

Basic issues in any reuse program; A Reuse Approach; Domain analysis; Component Classification; Searching; Repository Maintenance; Reuse without modifications

**BSIT(05)-602 ADVANCED JAVA PROGRAMMING**

**INSTRUCTIONS FOR PAPER-SETTER**

The question paper will consist of Two parts, A and B. Part A will have 15 short answer questions (40-60 words) of 2 marks each. Part B will have 12 long answer questions of 5 marks each.

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**INSTRUCTION FOR CANDIDATES**

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

**Section I**

**JAVA AWT :**

java AWT package Containers (Component, Container, Panel, Window, Frame, Canvas), Basic User Interface components (Labels, Buttons, Check Boxes, Radio Buttons, Choice, Text Fields, Text Areas, Scrollbars), Layouts (Flow Layout, Grid Layout, Border Layout, Card Layout).

**EVENT HANDLING:**

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Event delegation Approach, ActionListener, AdjustmentListener, MouseListener and MouseMotionListener, WindowListener, KeyListener

## Section II

### JAVA I/O HANDLING :

I/O File Handling(InputStream & OutputStreams, FileInputStream & FileOutputStream, Data I/P and O/P Streams, Buffered I/P and O/P Streams, File Class, Reader and Writer Streams, RandomAccessFile).

### MULTITHREADING :

Overview of Multithreading, The Thread control methods, Thread life cycle, Newly created threads, Main thread, Creating a Thread (Implementing Runnable Interface, Extending the Thread Class), Thread Synchronization, Writing Applets with Threads.

### SOCKET PROGRAMMING:

Introduction, TCP/IP Protocol, UDP Protocol, Ports, Using TCP/IP Sockets, Using UDP Sockets.

## Section – III

### JAVA DATABASE CONNECTIVITY (JDBC) :

JDBC/ODBC bridge, Driver Manager Class, Java.SQL Package (Connection Interface, Statement Interface, Prepared Statement Interface, ResultSet Interface, ResultSetMetaData Interface), SQL Exception class.

### REMOTE METHOD INVOCATION:

Client Architecture, Distributed object technologies, Locating & loading Remote classes, Locating remote objects & providing references to them, Enabling remote method call, RMI Architecture(Application Layer, Proxy Layer, Remote Reference Layer, Transport Layer), Naming, Remote Interface, Unicast Remote Object, Socket vs RMI programming

### JAVA SERVLETS :

Introduction to Server Side Technologies, Servlet Life cycle, HttpServlets, GenericServlets, init(), service(), doGet(), doPost(), destroy(), Servlets & JDBC.

BSIT(05)-603	C# WITH .NET
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## INSTRUCTIONS FOR PAPER-SETTER

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The syllabus of the subject is divided into 3 sections I, II and III. The question paper will cover the entire syllabus uniformly. Part A will carry 3 questions from each section and Part B will carry 4 questions from each section.

## INSTRUCTION FOR CANDIDATES

Candidates are required to attempt all questions from Part A and 9 questions of Part B out of 12.

## Section I

### Introduction:

What is C#, Why C#, Evolution of C#, Characteristics of C#, Applications of C#, How does C# differs from C++, How C #does differs from Java.

### Overview of C# :

Namespaces, Adding comments, Main returning a value, Using aliases for Namespace classes, Passing String objects to Write Line method, Command line arguments, Main with a Class, Providing interactive input, Using mathematical functions, multiple main methods, compile time errors, program structure, program coding style.

### Literals, Variables & Data Types :

Literals, variables, data types, value types, reference types, declaration of variables, initialization of variables, default values, constant variables, boxing & unboxing.

### Operators and Expressions :

Introduction; Arithmetic Operators; Relational Operators; Logical Operators; Assignment Operators; Increment and Decrement Operators; Conditional Operator; Bitwise Operators; Special Operators; Arithmetic Expressions; Evaluation of Expressions; Precedence of Arithmetic Operators; Type Conversions; Operator Precedence and Associativity; Mathematical Functions.

### Decision Making and Branching:

Introduction; Decision Making with if Statement; Simple if Statement; The if... else Statement; Nesting of if .....Else Statements; The else if Ladder; The Switch Statement; The? : Operator.

### Decision Making and Looping:

Introduction; The while Statement; The do Statement; the for Statement; the for each Statement; Jumps in Loops.

## Section II

### Methods in C# :

Introduction; Declaring Methods; The Main Method; Invoking Methods; Nesting of Methods; Method Parameters; Pass by Value; Pass by Reference; The Output Parameters; Variable Argument Lists; Methods Overloading.

### Handling Arrays:

Introduction; One-Dimensional Arrays; Creating an Array; Two-Dimensional Arrays; Variable-Size Arrays; the System. Array Class; Array List Class.

### Manipulating Strings:

Introduction; Creating Strings; String Methods; Inserting Strings Using System; Comparing Strings; Finding Substrings; Mutable Strings; Arrays of Strings; Regular Expressions.

### Structures and Enumerations :

Introduction; Structures; Structs with Methods; Nested Structs; Difference between Classes and Structs; Enumerations; Enumerator Initialization; Enumerator Base Types; Enumerator Type Conversion.

## Section III

**Classes and Objects :**

Introduction; Basic Principles of OOP; Defining a Class; Adding Variables; Adding Methods; Member Access Modifiers; Creating Objects; Accessing Class Members; Constructors; Overloaded Constructors; Static Members; Static Constructors; Private Constructors; Copy Constructors; Destructors; Member Initialization; The this Reference; Nesting of Classes, Constant Members; Read-only Members; Properties; Indexers.

**Inheritance and Polymorphism :**

Introduction; Classical Inheritance; Containment Inheritance; Defining a Subclass; Visibility Control; Defining Subclass Constructors; Multilevel Inheritance; Hierarchical Inheritance; Overriding Methods; Hiding Methods; Abstract Classes; Abstract Methods; Sealed Classes; Preventing Inheritance; Sealed Methods; Polymorphism.

**Interfaces:**

Multiple Inheritances:

Introduction; Defining an Interface; Extending an Interface; Implementing Interfaces; Interfaces and Inheritance; Explicit Interface Implementation; Abstract Class and Interfaces

**Operator Overloading :**

Introduction; Overload able Operators; Need for Operator Overloading; Defining Operator Overloading; Overloading Unary Operators; Overloading Binary Operators; Overloading Comparison Operators

**Managing Errors and Exceptions:**

Introduction; Types of Errors; Exceptions; Syntax of Exception Handling Code; Multiple Catch Statements; The Exception Hierarchy; General Catch Handler; Using finally Statement; Nested Try Blocks; Throwing Our Own Exceptions; Checked and Unchecked Exceptions; Using Exceptions For Debugging



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