

MARWARI COLLEGE, RANCHI
(AN AUTONOMOUS UNIT OF RANCHI UNIVERSITY FROM 2009)



**COURSES OF STUDY FOR INFORMATION
TECHNOLOGY HONOURS**

Under

DEPARTMENT OF PHYSICS

Number of Papers: 20

Full Marks: 1600

Number of Semesters: 6

BCA Hons. Part - I: 400 Marks

BCA Hons. Part - II: 400 Marks

BCA Hons. Part - III: 800 Marks

Framework of IT syllabus

IT - I SEMESTER

THEORY

CODE TITLE UNIT

1IT 1001 Fundamentals of Computer Science

1IT 1002 C and Data Structure

Practical

1IT 1003 MS-Office Lab; C Programming Lab

IT - II SEMESTER

2IT 2001 Operating System

2IT 2002 Scientific Computing

Practical

2IT 2003 Linux Programming Lab

IT - III SEMESTER

3IT 3001 Introduction to Object Oriented Analysis and Design Using C++

3IT 3002 Database Management System

Practical

3IT 3003 C++ Programming and DBMS Lab

IT - IV SEMESTER

4IT 4001 Computer Networks

4IT 4002 Programming in Visual Basic.NET

Practical

4IT 4003 Vb.Net programming Lab

IT - V SEMESTER

5IT 5001 Internet & Web Technology

5IT 5002 Java Programming Lab

5IT 5003 Software Engineering

Practical

5IT 5004 Java, XML, DHTML, ASP Programming Lab

IT - VI SEMESTER

6IT 6001 EDP

6IT 6002 Software Project Management

6IT 6003 Cyber laws

Practical

6IT 6004 Final Project

SUMMARY OF IT SYLLABUS						
Semester	Code	Paper	Full Marks	Mid Sem	End Sem	Pass Marks
First	1IT 1001	Fundamentals of Computer science	75	25	50	34
	1IT1002	C and data Structure	75	25	50	34
	1IT1003	Ms-Office and C Prog. Lab	50(25 E +25 I)		50	23
Second	2IT2001	Operating System	75	25	50	34
	2IT2002	Scientific Computing	75	25	50	34
	2IT2003	Linux Programming (Commands and Shell Prog.), Scientific Computing Lab	50(25 E +25 I)		50	23
Third	3IT3001	Introduction to Object Oriented Analysis & Design Using C++	75	25	50	34
	3IT3002	Data Base Management System	75	25	50	34
	3IT3003	C++ Prog. and Database Programming Using Oracle	50(25 E +25 I)		50	23
Fourth	4IT4001	Computer Networks	75	25	50	34
	4IT4002	Programming in VB.NET	75	25	50	34
	4IT4003	VB.Net Programming Lab	50(25 E +25 I)		50	23
Fifth	5IT5001	Internet & Web Technology	100	30	70	45
	5IT5002	Java Programming	100	30	70	45
	5IT5003	Software Engineering	100	30	70	45
	5IT5004	Java, XML, DHTML, Java Script ASP Programming Lab, Job Training (2)	50(25 E +25 I) + 50Job Training	50(JT)	50	45
Sixth	6IT6001	EDP	100	30	70	45
	6IT6002	Software Project Management	100	30	70	45
	6IT6003	Cyber laws	100	30	70	45
	6IT6004	Final Project	100		100	45

Note:

E: External
I: Internal
P: Practical
JT: Job Training

IT Part - I

SEMESTER - I

Paper - 1

1IT 1001 Fundamentals of Computer Science (Classes-50)

Full Marks: 25 (MSE) + 50 (ESE) = 75 Time: 3 hrs Pass Marks: 34

Instructions to Question-setter & Examinee

- This paper consist of **50 marks** and divided into three groups:
Group 1 : Multiple choice question, fill in the blanks and true false types (**15 x 1= 15**).
Group 2 : Concept based questions (5 out of 7 questions, each of 2 marks to be solved; words-limit 50 words) (**5 x 2 = 10**).
Group 3 : Descriptive type questions (4 out of 6 questions, each of 5 marks to be solved; words-limit 250 words) (**5 x 5 = 25**).
- The question must cover the entire syllabus with equal distribution of marks as far as practicable.

Introduction, Number system, conversion between number bases, signed and unsigned Nos., concept of overflow. 2's complement arithmetic.

Logic gates, truth tables, combinational logic circuits & realization with logic gates, Half and full adders and codes, Encoder, Decoder, code conversion.

Sequential circuits, JK, RS, T, D, Master slave flip flop, shift registers, synchronous & asynchronous counters.

Architecture of a simple computer, Architecture of 8085 and 8086, registers and ALU, Instruction set, Addressing modes, timing diagram, Fetch decode and execute cycle, interrupt mechanism, DMA. Memory hierarchies, RAM types of RAM, ROM, types of ROM introduction to virtual and cache memory.

Books recommended:

- Computer system Architecture – M. Mano
- Digital Electronics – Floyd
– B. Ram

IT Part - I

SEMESTER - I

Paper - 2

IIT 1002 C and Data Structure (Classes-50)

Full Marks: 25 (MSE) + 50 (ESE) = 75 Time: 3 hrs Pass Marks: 34

Instructions to Question-setter & Examinee

1. This paper consist of **50 marks** and divided into three groups:
 - Group 1 :** Multiple choice question, fill in the blanks and true false types (**15 x 1= 15**).
 - Group 2 :** Concept based questions (5 out of 7 questions, each of 2 marks to be solved; words-limit 50 words) (**5 x 2 = 10**).
 - Group 3 :** Descriptive type questions (4 out of 6 questions, each of 5 marks to be solved; words-limit 250 words) (**5 x 5 = 25**).
2. The question must cover the entire syllabus with equal distribution of marks as far as practicable.

History and Importance of C, Sample programming, Basic Structure and execution of C programmers, Constants, Variables, and Data Types and various type of declarations, Different type operators and Expressions, Evaluation of Expressions, Operator Precedence and Associability.

Managing Input and Output operations, Decision Making and Branching Decision Making and Looping.

One – dimensional Arrays and their declaration and Initializations, Two-dimensional Arrays and their initializations, String Variables, String – handling functions, Table and other features of Strings.

Need and Elements for user –defined Functions, Definition of Functions, Return values and their types, Function calls and Declaration, Arguments and corresponding return values, Functions that return multiple values, Nesting of functions, Recursion. The Scope, Visibility and Life time of variables.

Defining Structure, Declaring Structure Variable and Accessing Structure Members, Initialization of Structure, Comparing Structure Variables, Operation on Individual Members, Arrays of Structures, Structures within structures, Structures and Functions, Unions, Size of Structures.

Understanding Pointers, Accessing the Address of a Variable, Declaration and Initialization of Pointer Variables, Accessing a Variable through its Pointer. Pointers and Arrays, Pointers and Character Strings, Arrays of Pointers, Pointers and Function Arguments, File Management in C.

DS Fundamentals Definition of Data structure & Storage Structure. Classification of Data structures. Selection of a Data Structure.

Arrays (vectors and matrices)

Vectors (1-D arrays), Row-major & Column-major storage of a matrix, Addition of two matrices, Multiplication of two matrices, Character array vs. Strings

Stacks: Array implementation, Linked-list implementation, Postfix, Prefix and Infix Notation

Evaluation of postfix/prefix expression

Queues: Circular Queue, Deuel

Linked-list: Array implementation Linked-list, Singly, Doubly & Circular linked list

Graphs: Nomenclature, adjacency lists & adjacency matrix representation of graph.

Trees: Definition & Properties of Binary tree Pre-order, in-order, post-order and level order Traversal of binary tree, Binary search tree.

Sorting: Bubble, insertion, Quick & Merge Sort.

Searching: Sequential search & Binary Search.

Text Book:

1. E. Balagurusamy – Programming in ANSI C, 3rd Edn. , TMH, New Delhi; 2004

Reference:

1. Programming with C, B.S. Gottfried (TMH)
2. Let us C, 4th Edition, BPB Publication , New Delhi; 2002 – Y. Kanetkar
3. C Programming Language – Kernighan & Ritchie
4. Let us C – Y.P. Kanetkar
5. Data Structures – Lipschutz.
6. Data Structures through C –Y.P. Kanetkar

IT Part - I

SEMESTER - I

Paper – 3 (Practical)

1IT 1003 Ms-Office lab, C Programming lab.

Full Marks: 50

Time: 3 hrs

Pass Marks: 23

A. MS Office Lab

- 1 MS-Word
2. MS-Excel
3. MS-PowerPoint
4. MS-Access

B. C Programming Lab

- 1 C programming on variables and expressions.
- 2 Precedence of operators, Type casting.
- 3 Decision control structures— if and nested if-else.
- 4 Loop controls— do, while, for and case control structure.
- 5 Unconditional jumps— break, continue, goto.
- 6 Modular program development using functions.
- 7 Arrays and matrix operations—add, subtract, multiply.
- 8 Recursion
- 9 Pointers, address operators and pointer arithmetic.
- 10 Structures and Unions, Accessing their members.
- 11 Self-Referential Structures and Linked lists.
- 12 Files and file operations, standard streams.
- 13 Dynamic memory allocation and de-allocations.

IT Part - I

SEMESTER - II

Paper - 4

2IT 2001 Operating System (Classes-50)

Full Marks: 25 (MSE) + 50 (ESE) = 75 Time: 3 hrs Pass Marks: 34

Instructions to Question-setter & Examinee

1. This paper consist of **50 marks** and divided into three groups:
 - Group 1 :** Multiple choice question, fill in the blanks and true false types (**15 x 1= 15**).
 - Group 2 :** Concept based questions (5 out of 7 questions, each of 2 marks to be solved; words-limit 50 words) (**5 x 2 = 10**).
 - Group 3 :** Descriptive type questions (4 out of 6 questions, each of 5 marks to be solved; words-limit 250 words) (**5 x 5 = 25**).

2. The question must cover the entire syllabus with equal distribution of marks as far as practicable.

Introduction: What is an Operating System? Type of Operating System.

Operating-System Structures: System Components; Operating-System Services; System Calls; System Programs; System Structure, System Design and Implementation, System Generation.

Processes: Process Concept; Process Scheduling, Operations On Processes.

CPU Scheduling: Basic Concepts; Scheduling Criteria; Scheduling Algorithms.

Storage Management: Memory Management- Swapping, Contiguous Memory Allocation, Paging, Segmentation, Segmentation with Paging.

File-System Interface: File Concept; Access Methods; Directory Structure; Protection.

File-System Implementation: File-System Structure; File-System Implementation; Directory Implementation; Allocation Methods, Free-Space Management.

Mass-Storage Structure: Disk Structure; Disk Scheduling; Disk Management; Swap-Space Management.

Protection: Access Matrix; Access Rights.

Text Book:

1. A. Silberschatz et.al. – Operating System Concepts, 6th Edition, John Wiley Inc., 2003

Reference books:

1. H.M. Deitel – Operating Systems, 6th Edition, Pearson Education, 2006
2. D.M. Dhandhare – Operating Systems, 2nd Edition, Tata McGraw Hill, New Delhi, 2006

IT Part - I

SEMESTER - II

Paper – 5

2IT 2002 Scientific Computing (Classes-50)

Full Marks: 25 (MSE) + 50 (ESE) = 75 Time: 3 hrs Pass Marks: 34

Instructions to Question-setter & Examinee

1. This paper consist of **50 marks** and divided into three groups:
 - Group 1 :** Multiple choice question, fill in the blanks and true false types (**15 x 1= 15**).
 - Group 2 :** Concept based questions (5 out of 7 questions, each of 2 marks to be solved; words-limit 50 words) (**5 x 2 = 10**).
 - Group 3 :** Descriptive type questions (4 out of 6 questions, each of 5 marks to be solved; words-limit 250 words) (**5 x 5 = 25**).

2. The question must cover the entire syllabus with equal distribution of marks as far as practicable.

Basic Statistics-measure of central tendency, dispersion, Probability, distribution introduction to mass function, density function, distribution function (Binomial, Poisson, Normal).

Interpolation-Newtons Forward, Backward, Lagrange's Interpolation

Integration- Trapezoidal, Simpson's 1/3 rd, Newton Cotes Formula. Newton - Raphson Method.

Gauss Elimination Method, Gauss-Jacobi, Inverse Interpolation. Taylor's Series method, Runge-Kutta method, Milne's Predictor-Corrector method.

Books Recommended:

1. Numerical Analysis, Shastri, PHI
2. Numerical Analysis, S. Ali Mollah
3. Numerical Analysis, James B. Scarborough
4. Numerical Methods for Mathematics ,Science & Engg., Mathews, PHI
5. Numerical Analysis, G.S. Rao, New Age International
6. Programmed Statistics (Questions – Answers), G.S. Rao, New Age International
7. Numerical Analysis & Algorithms, Pradeep Niyogi, TMH
8. Computer Oriented Numerical Mathematics, N. Dutta, VIKAS
9. Numerical Methods, Arumugam, Scitech
10. Probability and Statistics for Engineers, Rao, Scitech
11. Numerical Methods in Computer Application,Wayse, EPH

IT Part - I
SEMESTER - II
Paper – 6 (Practical)
2IT 2003 Linux Programming lab
Time: 3 hrs

Full Marks: 50

Pass Marks: 23

Common commands on Linux, vi editor basics, shell programming.

IT Part - II

SEMESTER - III

Paper – 7

3IT 3001 Introduction to Object Oriented Analysis and Design Using C++ (Classes-50)

Full Marks: 25 (MSE) + 50 (ESE) = 75 Time: 3 hrs Pass Marks: 34

Instructions to Question-setter & Examinee

1. This paper consist of **50 marks** and divided into three groups:
Group 1 : Multiple choice question, fill in the blanks and true false types (**15 x 1= 15**).
Group 2 : Concept based questions (5 out of 7 questions, each of 2 marks to be solved; words-limit 50 words) (**5 x 2 = 10**).
Group 3 : Descriptive type questions (4 out of 6 questions, each of 5 marks to be solved; words-limit 250 words) (**5 x 5 = 25**).

2. The question must cover the entire syllabus with equal distribution of marks as far as practicable.

Concepts of OOPS and differences with procedural languages, characteristics of OOPS (Idea of objects, class, data abstraction & encapsulation, inheritance polymorphism, dynamic binding, 1/0 stream, Cin, Count, 1/0 manipulation).

Data types, operators, control structure & looping statements, functions, and arrays.

Objects & classes: classes & objects, constructor, destructor, overloading binary operators, data conversion.

Inheritance: Derived class and base class, protected access specifier, derived class constructors, class hierarchies, abstract base class, public and private inheritance, multiple inheritance, containership (classes within classes).

Pointers: Address and pointers, pointers and arrays, memory management, "New" & "Delete" pointer to objects, linked list, pointer to pointer .

Virtual functions: Virtual functions, friend functions, static functions, "This" pointer.

Files and streams: String, string 1/0, object 1/0,1/0 with multiple objects file pointer, error handling, and redirection.

Templates in C ++

Books Recommended:

1. C++ - Lafore
2. C++ - Balaguruswamy
3. C ++ - Kanetkar
4. OOPS Concept - Booch

IT Part - II

SEMESTER - III

Paper – 8

3IT 3002 Database Management System (Classes-50)

Full Marks: 25 (MSE) + 50 (ESE) = 75 Time: 3 hrs Pass Marks: 34

Instructions to Question-setter & Examinee

1. This paper consist of **50 marks** and divided into three groups:
 - Group 1 :** Multiple choice question, fill in the blanks and true false types (**15 x 1= 15**).
 - Group 2 :** Concept based questions (5 out of 7 questions, each of 2 marks to be solved; words-limit 50 words) (**5 x 2 = 10**).
 - Group 3 :** Descriptive type questions (4 out of 6 questions, each of 5 marks to be solved; words-limit 250 words) (**5 x 5 = 25**).
2. The question must cover the entire syllabus with equal distribution of marks as far as practicable.

DATABASE SYSTEM CONCEPTS & ARCHITECTURE:

Definition, Architecture of DBMS, Schemas, Instances, Database Languages, Data Models.

DATA MODELING:

Data Models, ER Diagrams, Subclasses, Superclasses and Inheritance, Specialization & Generalization, Conceptual Object Modeling using UML Class Diagrams, Knowledge Representation Concepts, Exercises.

RELATIONAL DATA MODEL:

Relational Constraints, Domain Constraints, Key Constraints Referential Integrity Constraints, Relational Algebra, Fundamental Operations of Relational Algebra & their Implementation, Interdependence of Operations, Example Queries.

ER AND EER TO RELATIONAL MAPPING:

Mapping EER Model Concepts to Relation, Tuple Relational Calculus, Domain Relational Calculus Queries.

DATABASE DESIGN:

Functional Dependencies, Irreducible Sets of Dependencies, Lossless Decomposition, 1st, 2nd & 3rd NF, Boyce Codd NF, Multivalued Dependency & 4th NF, Join Dependency & 5 NF, Domain Key normal Form, Denormalization.

TRANSACTION –

Schedules, Serializability, Precedence Graph, Concurrency Control Techniques, Implementation of Transaction in Programs, Cursors and Transaction, Recovery, Checkpoints.

DATABASE SECURITY & AUTHORIZATION:

Specifying Privileges, Revoking Privileges, propagation of Privileges, Statistical Database Security.

TEXT BOOKS:

1. Fundamental of Database Systems – Elmasri Navathe-Pearson Education Asia
2. Database – Principles, Programming and Performance – Parick O’ Neil Elizabeth O’ Niel, Harcourt Asia PTE Limited.

REFERENCES BOOKS:

1. An Introduction to Database Systems – C.J. Date, Addison Wesley, Pearson Education Press
2. Database System Concepts- Abraham Silberschat, Henry F. Korth, S. Sudarshan, Tata McGraw Hill.

Books Recommended:

1. DBMS – Korth

2. DBMS – C.J. Date
3. Oracle – E. Byross
4. DBMS – Mazumdar

IT Part - II
SEMESTER - III
Paper – 9 (Practical)
3IT 3003 C++, DBMS lab

Full Marks: 50

Time: 3 hrs

Pass Marks: 23

A. C++ Lab

Basic C++ programming using cout, cin, if, if else, nested if, for, while, do while, goto, select case, break, nested for.

Function, Array, pointer, string handling

Program for Class and Object, Constructor, destructor. This pointer, inline function, Copy Constructor, Constructor overloading, static function, operator overloading, function overloading, Inheritance, Polymorphism (virtual function), File handling.

B. DBMS Lab

Learning basic DDL and DML commands

Learning basic DCL and TCL commands.

Insertion, Deletion, Updating to a table using SQL commands

Working with dual table.

Data retrieval using Select & where clause.

Oracle inbuilt functions-Date, aggregate, group by etc.

Use of Joins and Sub queries.

Views, sequences and indexes.

Introduction to PL/SQL

IT Part - II

SEMESTER - IV

Paper - 10

4IT 4001 Computer Networks (Classes-50)

Full Marks: 25 (MSE) + 50 (ESE) = 75 Time: 3 hrs Pass Marks: 34

Instructions to Question-setter & Examinee

1. This paper consist of **50 marks** and divided into three groups:
 - Group 1 :** Multiple choice question, fill in the blanks and true false types (**15 x 1= 15**).
 - Group 2 :** Concept based questions (5 out of 7 questions, each of 2 marks to be solved; words-limit 50 words) (**5 x 2 = 10**).
 - Group 3 :** Descriptive type questions (4 out of 6 questions, each of 5 marks to be solved; words-limit 250 words) (**5 x 5 = 25**).

2. The question must cover the entire syllabus with equal distribution of marks as far as practicable.

Computer Networks

Basic network concepts, Advantages and disadvantages of computer network, Types of networks-LAN, WAN, MAN. Network topologies. Hardware requirement of a network. Network operating system.

A communication model, communication tasks, three-layer approach to protocols, brief introduction to TCP/IP and OSI (brief function to different layers).

Data transmission: concept and terminology, analog and digital data transmission, Transmission impairments. Guided transmission media.

Data encoding digital data digital signal, digital data analog signal, analog data digital signal and analog data analog signal.

Asynchronous & synchronous transmission, interfacing.

Data link control: flow control, error detection (CRC), Error control, High level data control (HDLC).

Multiplexing, statistical time division multiplexing.

Circuit switching: switched network, circuit switching networks, switching concepts, routing in circuit switched networks.

Packet switching : packet switching principals, routing, congestion and control, X.25, Dijkstra's algorithm, Bellman ford algorithm.

LAN Technology: LAN architecture, Bus/Tree LAN, Ring & Star LANs. Ethernet and fast Ethernet (CSMA/CD), Token ring and FDDI.

Bridges: Bridge operation, routing with bridges

Network Security: Requirements, conventional encryption, public key encryption & digital signature.

IT Part - II

SEMESTER - IV

Paper - 11

4IT 4002 Programming in Visual Basic.NET (Classes-50)

Full Marks: 25 (MSE) + 50 (ESE) = 75 Time: 3 hrs Pass Marks: 34

Instructions to Question-setter & Examinee

1. This paper consist of **50 marks** and divided into three groups:
Group 1 : Multiple choice question, fill in the blanks and true false types (**15 x 1= 15**).
Group 2 : Concept based questions (5 out of 7 questions, each of 2 marks to be solved; words-limit 50 words) (**5 x 2 = 10**).
Group 3 : Descriptive type questions (4 out of 6 questions, each of 5 marks to be solved; words-limit 250 words) (**5 x 5 = 25**).

2. The question must cover the entire syllabus with equal distribution of marks as far as practicable.

Programming in Visual Basic.NET

What is .NET, Overview of .NET Framework, Common Language Runtime: Assemblies
Modules, types?

Object Oriented terminology: Objects, Classes, and Instances.

Constructor, Constructors with Parameter, Constructor Overloading, Overloading methods,
Inheritance, Overriding, Interface.

Namespaces: Common namespaces.

Windows Forms: Using Forms via Sub Main, Forms at Design Time, startup Forms,
Control Arrays, validating data entry, Menus, Context Menu, Toolbars, MDI Forms,

Data Access with ADO.NET: ADO.NET Architecture, Datasets, Data Providers, Connection
Object, Data Adapter Objects, Dataset Collection

Text Book:

VB.NET 2003 3rd Edition –Bill Evjen- Wiley dreamtech India pvt. Ltd.

IT Part - II
SEMESTER - IV
Paper – 12 (Practical)
4IT 4003 Vb.Net Programming Lab

Full Marks: 50

Time: 3 hrs

Pass Marks: 23

IT Part - III SEMESTER - V

Paper - 13

5IT 5001 Internet & Web Technology (Classes-50)

Full Marks: 30 (MSE) + 70 (ESE) = 100 Time: 3 hrs Pass Marks: 45

Instructions to Question-setter & Examinee

1. This paper consist of **70 marks** and divided into four groups:
 - Group 1 :** Multiple choice question, fill in the blanks and true false types (**15 x 1= 15**).
 - Group 2 :** Concept based questions (5 out of 7 questions, each of 5 marks to be solved; words-limit 50 words) (**5 x 5 = 25**).
 - Group 3 :** Descriptive type questions (3 out of 5 questions, each of 10 marks to be solved; words-limit 250 words) (**3x10 = 30**).

2. The question must cover the entire syllabus with equal distribution of marks as far as practicable.

Internet & Web Technology

Internet Basics: Basic concepts, Communication on the Internet, Internet Domains, Internet Server Identities, Establishing Connectivity on the Internet, Client IP Address, A Brief Overview of TCP/IP and its Services, Transmission Control Protocol, Web Server , Web Client, Domain Registration

Introduction to HTML: HTML, HTML Tags, Commonly Used HTML Commands, Title and Footers, Text Formatting, Text Style, Lists, Adding Graphics to HTML Documents, Tables, Linking Documents, Frames.

Java Script : Java Script in Web Pages, Advantages of Java Script, Advantages of Java Script, Data Types and Literals, Type Casting, Java Script Array, Operators and Expression, Conditional Checking , Function, User Defined Function.

Understanding XML: SGML, XML, XML and HTML, Modeling XML Data, Styling XML with XSL, XHTML

Creation of Dynamic Web pages using ASP: Dynamic Web Page, Introduction of ASP,Pages Overview, ASP Scripting, Database Connectivity, Recordset

Text Books:

1. Ivan Bay Ross- Web Enable Commercial Application Using HTML, DHTML, XML, and ASP - BPB Publication
2. Michel Morrison -HTML and XML for Beginners, PHI, New Delhi- 2001

IT Part - III SEMESTER - V

Paper - 14

5IT 5002 Java Programming (Classes-50)

Full Marks: 30 (MSE) + 70 (ESE) = 100 **Time:** 3 hrs **Pass Marks:** 45

Instructions to Question-setter & Examinee

1. This paper consist of **70 marks** and divided into four groups:
 - Group 1 :** Multiple choice question, fill in the blanks and true false types (15 x 1= 15).
 - Group 2 :** Concept based questions (5 out of 7 questions, each of 5 marks to be solved; words-limit 50 words) (5 x 5 = 25).
 - Group 3 :** Descriptive type questions (3 out of 5 questions, each of 10 marks to be solved; words-limit 250 words) (3x10 = 30).

2. The question must cover the entire syllabus with equal distribution of marks as far as practicable.

Java Programming

Java Evolution and Overview of Java Language: How Java differs from C and C++,Java and Internet, Java and World Wide Web, Introduction, Simple Java Program, More of Java, An Application with Two Classes, Java Program Structure, Java Tokens, Java Statements, Implementing a Java Program, Java Virtual Machine, Command Line Arguments, Programming Style.

Constants, Variables, and Data Types: Introduction, Constants, Variables, Data Types, Declaration of Variables, Giving Values of Variables, Scope of Variables, Symbolic Constants, Type Casting, Getting Values of Variables, Standard Default Values.

Operators and Expressions: Introduction, Arithmetic Operators, Relational Operators, Logical Operators, Assignment Operators, Increment and Decrement Operators, Conditional Operators, Bitwise Operators, Special Operators, Arithmetic Expressions, Evolution of Expressions, Precedence of Arithmetic Operators, Type Conversion in Expressions, 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, Jumps in Loops, Labeled Loops.

Classes, Objects and Methods: Introduction, Defining a Class, Adding Variables, Adding Methods, Creating Objects, Accessing Class Members, Constructors, Methods Overloading, Static Members, Nesting of Methods, Inheritance: Extending a. Class, Overriding Methods, final Variables and Methods, Final Classes, Finalize Methods, Abstract Methods and Classes, Visibility Control.

Arrays, String and Vectors: Arrays, One-Dimensional Arrays, Creating an Array, Two-Dimensional Arrays, Strings, Vectors, Wrapper Classes.

Interfaces: Multiple Inheritances: Introduction, Defining Interfaces, Extending Interfaces, Implementing Interfaces, Accessing Interface Variables.

Packages: Putting Classes Together: Introduction, Java API Packages, Using system Packages, Naming Conventions, Creating Packages, Accessing a Packages, Using a Package, Adding a Class to a Package, Hiding Classes.

Multithreaded Programming: Introduction, Creating Threads, Extending the Thread Class, Stopping and Blocking a Thread, Life Cycle of a Thread, Using Thread Methods, Thread Exceptions, Thread Priority and Synchronization.

Managing Errors and Exceptions: Introduction, Types of Errors, 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 Application, Preparing to Write Applets, Building Applet Code, Applet Life Cycle, Creating an Executable Applet, Designing a

Web Page, Applet Tag, Adding Applet to HTML File, Running the Applet, More About Applet Tag, Passing Parameters to Applets.

Managing Input/Output Files in Java: Introduction, Concepts of Streams Stream Classes, Byte Stream Classes, Character Stream Classes, Using Streams, Other Useful I/O Classes, using the File Class, Input/Output Exceptions, Creation of Files.

Text Book:

1. E. Balagurusamy – Programming with Java, A Primer Second Edition, Tata McGraw Hill, New Delhi.

Reference Books:

1. H.M.Deitel & P.J.Deitel – JAVA- How to Program, 5th Edn, Pearson Education, New Delhi-2004.
2. P.Naughton and H. Schildt – JAVA: The Complete Reference, TMH, New Delhi 2005.
3. D.Jana – Java and Object Oriented Programming Paradigm, PHI, New Delhi-2005

IT Part - III SEMESTER - V

Paper - 15

5IT 5003 Software Engineering (Classes-50)

Full Marks: 30 (MSE) + 70 (ESE) = 100 Time: 3 hrs Pass Marks: 45

Instructions to Question-setter & Examinee

1. This paper consist of **70 marks** and divided into four groups:
 - Group 1 :** Multiple choice question, fill in the blanks and true false types (**15 x 1= 15**).
 - Group 2 :** Concept based questions (5 out of 7 questions, each of 5 marks to be solved; words-limit 50 words) (**5 x 5 = 25**).
 - Group 3 :** Descriptive type questions (3 out of 5 questions, each of 10 marks to be solved; words-limit 250 words) (**3x10 = 30**).

2. The question must cover the entire syllabus with equal distribution of marks as far as practicable.

Software Engineering

Introduction to Software Engineering: Characteristics, Emergence of Software Engineering, Software Metrics & Models, Process & Product Metrics.

Software Life Cycle Models: Waterfall, Prototype and Spiral Models and their Comparison.

Software Project Management: Size Estimation- LOC and FP Metrics, Cost Estimation-COCOMO

Software Requirements Specification: SRS Documents, their Characteristics and Organization.

Software Design: Classification, Software Design Approaches, Function Oriented Software Design, Structured Analysis- Data flow Diagrams and Structured Design, Introduction to Object Oriented Design.

Coding and Testing of Software: Unit Testing, Integration Testing, System Testing, Verification and validation.

Software Reliability and Quality Assurance: Reliability Metrics.

Software Development Tools: Introduction to "Rational Rose".

Text Book:

1. Rajib Mall -Fundamentals of Software Engineering, Prentice Hall of India, New Delhi,2005

Reference Book:

1. Pankaj Jalote- An Integrated Approach to Software Engineering, 3rd Edition, Narosa Publishing House, New Delhi,2005
2. Richard Fairley- Software Engineering Concepts, Tata McGraw Hill, New Delhi, 2006

IT Part - III
SEMESTER - V
Paper – 16 (Practical)
5IT 5004 Java Prog., XML, DHTML, ASP Programming lab

Full Marks: 50

Time: 3 hrs

Pass Marks: 23

Java Prog., XML, DHTML, ASP Programming Lab

Java: Simple programming using Java, applet creation

ASP: Overview to ASP, Creation of Virtual Directory, Active Data object, ADO Connection with MS-Access, ADO Command object and Query, Creation of Recordset, Execute method of command object, Open method of RecordSet Object, Execute method of Connection Object, Insertion, Deletion and Modification of Data in a Database.

DHTML: Overview to DHTML, Features of DHTML, Document Object Model, Events, Inner Text Property, Dynamically changing Text Attributes (Style sheet and its properties, inline, Embedded, External & Imported Style Sheets), Displaying items in Tree structure.

XML: SGML, XML, XML and HTML, Modeling XML Data, Styling XML with XSL, XHTML

IT Part - III SEMESTER - VI

Paper - 17

6IT 6001 EDP (Classes-50)

Full Marks: 30 (MSE) + 70 (ESE) = 100 Time: 3 hrs Pass Marks: 45

Instructions to Question-setter & Examinee

1. This paper consist of **70 marks** and divided into four groups:
 - Group 1 :** Multiple choice question, fill in the blanks and true false types (**15 x 1= 15**).
 - Group 2 :** Concept based questions (5 out of 7 questions, each of 5 marks to be solved; words-limit 50 words) (**5 x 5 = 25**).
 - Group 3 :** Descriptive type questions (3 out of 5 questions, each of 10 marks to be solved; words-limit 250 words) (**3x10 = 30**).

2. The question must cover the entire syllabus with equal distribution of marks as far as practicable.

EDP

Need, scope and characteristics of Entrepreneurship, special schemes for Technical Entrepreneurs, STED.

Identification of opportunity.

Exposure to demand based, resource based, service based, import substitute and export promotion Industries.

Market survey Techniques.

Need scope and approaches for project formulation.

Criteria for Principles of Product selection and development.

Structure of project report.

Choice of technology, plant and equipment.

Institutions, financing procedure and financial incentives.

Financial ratio and their significance.

Books of accounts, financial statements and funds flow analysis.

Energy requirement and Utilization.

Resource Management Men, Machine and Materials.

Critical Path Method [CPM] and Project Evaluation Review Techniques [PERT] as planning tools for establishing SSI.

A] Creativity and innovation.

b] Strength weakness Opportunity and Threat [SWOT] Techniques.

Techno – economic feasibility of the project.

Plant layout and Process Planning for the product.

Quality control/quality assurance and testing of product.

Elements of Marketing and Sales management.

A] Nature of product and market strategy

b] Packaging and advertising.

c] After Sales service.

Costing and Pricing.

Management of self and understanding human behavior.

Sickness in small scale industries and their remedial measures.

Copying with uncertainties, stress management and positive reinforcement.

A] Licensing , registration.

b] Municipal bye laws and insurance coverage.

Important provisions of factory Act , Sales of Goods Act , Partnership Act.

a] Dilution control

b] Social responsibility and business ethics.

Income Tax , Sales Tax and Excise Rules.

Conduct of mini market survey (One day exercise) : Data collection through questionnaire and personal visits.

Entrepreneurial Motivation Training: Through games, role playing discussions and exercises.

(a) Working capital and fixed capital: Practice assessment and management

(b) Exercise on working capital: Practice fixed capital calculation

(a) Analysis of sample project report: Discussion

(b) Break even analysis: Practice

Communication written and oral: Practice

IT Part - III SEMESTER - VI

Paper - 18

6IT 6002 Software Project Management (Classes-50)

Full Marks: 30 (MSE) + 70 (ESE) = 100 Time: 3 hrs Pass Marks: 45

Instructions to Question-setter & Examinee

1. This paper consist of **70 marks** and divided into four groups:
 - Group 1 :** Multiple choice question, fill in the blanks and true false types (**15 x 1= 15**).
 - Group 2 :** Concept based questions (5 out of 7 questions, each of 5 marks to be solved; words-limit 50 words) (**5 x 5 = 25**).
 - Group 3 :** Descriptive type questions (3 out of 5 questions, each of 10 marks to be solved; words-limit 250 words) (**3x10 = 30**).
2. The question must cover the entire syllabus with equal distribution of marks as far as practicable.

Software Project Management

Introduction To Software Project Management And Step Wise Project Planning:

Introduction, What is a Project? Software Projects Versus Other Types of Project, Contact Management and Technical Project Management, Activities Covered by Software Project Management, Plans, Methods, and Methodologies, Some ways of Categorizing Software Projects, What is Management?, Problems with Software Projects, Setting Objectives, Stakeholders, The Business Case, Requirement Specification, Management Control, Overview of Project Planning (Step wise).

Project Evaluation:

Introduction, Strategic Assessment, Technical Assessment, Cost- Benefit Analysis, Cash Flow Forecasting, Cost- Benefit Evaluation Techniques, Risk Evaluation.

Selection Of An Appropriate Project Approach:

Introduction, Choosing Technologies, Technical Plan Contents List, Choice of Process Models, Structure Versus Speed of Delivery, The Waterfall Model, The V- Process Model, The Spiral Model, Software Prototyping, Other ways of Categorizing Prototyping, Controlling Changes during Prototyping, Incremental Delivery, Dynamic Systems Development Method, Extreme Programming, Managing Iterative Processes.

Software Effort Estimation:

Introduction, Where are Estimates done? , Problems with Over-and Under- Estimates, The Basis for Software Estimating, Software Effort Estimation Techniques, Expert Judgment, Estimating by Analogy, Albrecht Function Point Analysis, Function Point Mark II, Object Points, A Procedural Code- Oriented Approach, COCOMO: A Parametric Model.

Activity Planning:

Introduction, The Objectives of Activity Planning, When to Plan, Project Schedules, Projects and Activities, Sequencing and Scheduling Activities, Network Planning Models, Formulating a Network Model, Adding the Time Dimension, The Forward Pass, The Backward Pass, Identifying the Critical Path, Activity Float, Shortening the Project Duration, Identifying Critical Activities, Activity- On – Arrow Networks.

Risk Management:

Introduction, The Nature of Risk, Types of Risk, Managing Risk, Hazard Identification, Hazard Analysis, Risk Planning and Control, Evaluating Risks to the Schedule.

Software Quality:

Introduction, The Place Of Software Quality In Project Planning, The Importance Of Software Quality, Defining Software Quality, ISO 9126, Practical Software Quality Measures, Product Versus Process Quality Management, External Standards, Techniques To Help Enhance Software Quality, Quality Plans.

Text Book:

B.Huges and M.Cotterell- Software Project Management 3rd Edn, TMH, New Delhi, 2004.

Reference Book:

P.Jolote- Software Project Management in Practice, Pearson Education,
New Delhi, 2002.

IT Part - III

SEMESTER - VI

Paper - 19

6IT 6002 Cyber Laws (Classes-50)

Full Marks: 30 (MSE) + 70 (ESE) = 100 Time: 3 hrs Pass Marks: 45

Instructions to Question-setter & Examinee

1. This paper consist of **70 marks** and divided into four groups:
 - Group 1 :** Multiple choice question, fill in the blanks and true false types (**15 x 1= 15**).
 - Group 2 :** Concept based questions (5 out of 7 questions, each of 5 marks to be solved; words-limit 50 words) (**5 x 5 = 25**).
 - Group 3 :** Descriptive type questions (3 out of 5 questions, each of 10 marks to be solved; words-limit 250 words) (**3x10 = 30**).
2. The question must cover the entire syllabus with equal distribution of marks as far as practicable.

Cyber Laws

Objective: To learn IT security – threats, detection and prevention and Cyber Laws and provisions.

1 Object and Scope of the IT Act

- 1.1 Genesis
- 1.2 Object
- 1.3 Scope of the Act

2 Encryption

- 1.1 Symmetric Cryptography
- 1.2 Asymmetric Cryptography
- 1.3 RSA Algorithm
- 1.4 Public Key Encryption

3 Digital Signature

- 3.1 Technology behind Digital Signature
- 3.2 Creating a Digital Signature
- 3.3 Verifying a Digital Signature
- 3.4 Digital Signature and PKI
- 3.5 Digital Signature and the Law

4 E-Governance and IT Act 2000

- 4.1 Legal recognition of electronic records
- 4.2 Legal recognition of digital signature
- 4.3 Use of electronic records and digital signatures in Government and its agencies

5 Certifying Authorities

- 5.1 Need of Certifying Authority and Power
- 5.2 Appointment, function of Controller
- 5.3 Who can be a Certifying Authority?
- 5.4 Digital Signature Certifications
- 5.5 Generation, Suspension and Revocation Of Digital Signature Certificate

6 Domain Name Disputes and Trademark Law

- 6.1 Concept of Domain Names
- 6.2 New Concepts in Trademark Jurisprudence

- 6.3 Cyber squatting, Reverse Hijacking, Meta tags, Framing, Spamming,
- 6.4 Jurisdiction in Trademark Dispute

7 Cyber Regulations Appellate Tribunal

- 7.1 Establishment & Composition Of Appellate Tribunal
- 7.2 Powers of Adjudicating officer to Award Compensation
- 7.3 Powers of Adjudicating officer to Impose Penalty

8 The Cyber Crimes (S-65 to S-74)

- 8.1 Tampering with Computer Source Documents(S-65)
- 8.2 Hacking with Computer System(S-66)
- 8.3 Publishing of Information Which is Obscene in Electronic Form(s-67)
- 8.4 Offences : Breach of Confidentiality & Privacy (S-72)
- 8.5 Offences : Related to Digital Signature Certificate(S-73 & S-74)

Reference:

- 1) Cyber Law in India by Farooq Ahmad – Pioneer Books
- 2) Information Technology Law and Practice by Vakul Sharma – Universal Law Publishing Co. Pvt. Ltd.
- 3) The Indian Cyber Law by Suresh T Vishwanathan – Bharat Law house New Delhi.
- 4) Hand book of Cyber & E-commerce Laws by P.M. Bakshi & R.K.Suri – Bharat Law house New Delhi.
- 5) Guide to Cyber Laws by Rodney D. Ryder – Wadhwa and Company Nagpur.
- 6) The Information Technology Act,2000 – Bare Act – Professional Book Publishers – New Delhi.

IT Part - III
SEMESTER - VI
Paper – 20 (Final Project)
6IT 6004 Final Project

Full Marks: 100

Pass Marks: 45