Master of Science (Information Technology)

Two Year (Four Semester) Course

The course of study of M.Sc. IT shall extend over a period of **four semesters** spread over two years. On satisfactory completion of the course and after passing the examinations, a candidate will be awarded the Master of Science (Information Technology) degree.

Every academic year shall be divided into two semesters. First semester starts from July and ends in December. Second semester starts from January and ends in June and so on. There shall be an examination at the end of each semester. The examinations shall consist of theory papers, practical papers.
Medium of instructions and examination will be **English** only.

Eligibility for Admission:
The admission of the students for M.Sc(IT) I and III Semester will be taken for July to December session and II and IV Semester will be from January to June session.
A candidate who has qualified graduate degree with at least 50% marks (48% for SC/ST/OBC/SOBC category) of Rajasthan University or any other university recognized as equivalent shall be admitted to the first year of M.Sc. (Information Technology) Course .

Semester	Course Duration	Examination Time
I , III	July to December	December
II, IV	January to June	June

Examination Scheme:
Each theory paper shall be of 100 marks (70 marks for written examination of 3 hrs duration and 30 marks for internal assessment).
Each practical paper shall be of 100 marks (60 for practical exam and 40 for internal assessment).
The basis for internal evaluation in theory shall be home assignment, internal test and regularities in the attendance.
The basis for internal assessment in the laboratory courses shall be timely submission of the lab. records, performance in the lab., internal tests etc.

Each theory paper examination will be of three-hour duration and shall carry 70 marks. Theory paper shall contain three parts.

a) Part-A will contain 12 very short questions of 1 mark each (student will attempt any 10).
b) Part B will contain 4 short descriptive types of questions each carrying 5 marks, all are compulsory.
c) Part C will contain 4 long descriptive types of questions each carrying 10 marks, all questions are compulsory with internal choice.

Each practical examination (Maximum marks 100) will be of four- hour duration on one day and carry 60 marks for exercise(s) assigned in the examination and Viva , and 40 marks for the Internal Assessment.

S.No.	Question Pattern	Max. Marks (Theory)		Max. Marks (Practical)	
		ESE	CIA	ESE	CIA
1	Part A: 12 Very Short Questions (attempt any 10)	10 X 1=10			
2	Part B: 4 Short Question from all Units (Compulsory)	4 X 5 =20			
3	Part C: 4 Questions from each Unit with Internal Choice	4 X 10=40			
	Sub Total	**70**	**30**	**60**	**40**
		100		**100**	

<u>Passing Criteria</u>: Rules and Regulations for promotion of students to higher classes and matters related to examinations

- Promotion from odd semesters to even semesters is automatic, provided the student has registered his / her name for the examination by paying the required examination fee.
- To gain eligibility for promotion to the next year (III Sem.), a student is required to pass in at least 60% of the subjects offered in the previous year's semesters put together.
- A student is required to score a minimum of 40% in a subject (theory and internal assessment put together). However, he/she has to score a minimum of 40% in theory. In the case of subjects with practical it is mandatory for the student to score 40% in the practical examination to be declared to have passed in that subject. If the student fails in theory or practical he/she should reappear for theory or practical examination as the case may be. Examinations will be conducted for odd and even semesters at the end of each semester. There is no provision of Supplementary examinations in Semester Scheme courses.
- If student does not secure minimum marks in theory paper but clears the practical exam of that paper then practical marks will be carried forward.
- Students have to appear in both the internal exams of each semester. There will be no provision of repeat internal examinations under any circumstances.
- Candidate must complete the course within the double of the course duration time after appearing in the main exam. Candidate will be allowed to appear 3 times (1 Main + 2 extra attempts) in that particular paper.

- Candidate taking admission in Autonomous course will not be allowed to simultaneously pursue any other regular course from any other university and they will also not be allowed to do any full time job.

Attendance:
A candidate shall be required to put in a minimum of 75% attendance at the lectures and 75% attendance at the practical's separately in each paper.

Examination Scheme:

Sr. No.	Paper	ESE	CIA	Total
1	Theory	70%	30%	100
2	Practical	60%	40%	100

Number of Units in Syllabus:

Sr. No.	Stream	No. of Units
1	M.Sc.(IT)	4

Maximum Marks for the Course and Number of Units of Each subject 2 Years / 4 Semesters:

Sr. No	Stream	Semester	Number of Papers per semester		Total Marks of 1 Semester	Sub Total	Grand Total
			Theory	Practical			
1	M. Sc. (IT)						
		I ,II, III Sem	5 X 100	3 X 100	500 +300 = 800	800 X 3 = 2400	2400
		IV Sem, Project	3 X 100	1 X 100 1 X 200	300+300 = 600	600 X 1 =600	600
							3000

Award of Division and Grade:
To award Division and Grade to students the total of two internal assessment & End term semester exam marks in all subjects will be considered. Over all merit / rank of student will be declared after compilation of marks / grade secured by the candidate in all the semesters of that course.
The distribution is as follows.

% of Marks	Division	Grade
90.01 % and above	I	Outstanding
80.01 – 90.0%	I	A++
70.01 – 80.0%	I	A+
60.0 – 70.0%	I	A
54.01 – 59.99%	II	B
48.01 – 54.0 %	II	C
40.01 – 48.0%	Pass	D
Less than 40.0%	Reappear/Fail	E

Semester Structure:

M.Sc. Information Technology Semester I

Paper Code	Theory Papers	Teaching Per Week Hrs	End Semester Exam (ESE)	Continuous Internal Assessment (CIA)	Exam Hrs.	Credits
PMIT101	Programming Fundamentals	04	70	30	03	4
PMIT102	Database Management System	04	70	30	03	4
PMIT103	Office Management Tools (For Session 2013-14 Only) Discrete Mathematics (From Session 2014-15 onwards)	04	70	30	03	4
PMIT104	Computer Architecture	04	70	30	03	4
PMIT105	Operating System	04	70	30	03	4
	Practical Papers					
PMIT151	'C' Programming Lab	04	60	40	06	3
PMIT152	DBMS Lab	04	60	40	06	3
PMIT153	Office Management Lab	04	60	40	06	3
	Total	**32**	**530**	**270**	**33**	**29**

M.Sc. Information Technology Semester II

Paper Code	Theory Papers	Teaching Per Week Hrs.	End Semester Exam (ESE)	Continuous Internal Assessment (CIA)	Exam Hrs.	Credits
PMIT201	Object Oriented Programming Concepts	04	70	30	03	4
PMIT202	Data Structure and Algorithms	04	70	30	03	4
PMIT203	Web Designing and Development	04	70	30	03	4
PMIT204	Management Information System	04	70	30	03	4
PMIT205	Data Communication and Networking	04	70	30	03	4
	Practical Papers					
PMIT251	C++ Programming Lab	04	60	40	06	3
PMIT252	Data Structure Lab	04	60	40	06	3
PMIT253	Web Designing Lab	04	60	40	06	3
	Total	**32**	**530**	**270**	**33**	**29**

M.Sc. Information Technology Semester III

Paper Code	Theory Papers	Teaching Per Week Hrs	End Semester Exam (ESE)	Continuous Internal Assessment (CIA)	Exam Hrs.	Credits
PMIT301	.Net Technologies	04	70	30	03	4
PMIT302	Java Programming	04	70	30	03	4
PMIT303	Computer Graphics	04	70	30	03	4
PMIT304	E-Commerce Application Development	04	70	30	03	4
PMIT305	Software Engineering and Testing	04	70	30	03	4
	Practical Papers					
PMIT351	.Net Lab	04	60	40	06	3
PMIT352	Java Lab	04	60	40	06	3
PMIT353	Computer Graphics Lab	04	60	40	06	3
	Total	**32**	**530**	**270**	**33**	**29**

M.Sc. Information Technology Semester IV

Paper Code	Theory (Elective Paper)	Teaching Per Week Hrs	End Semester Exam (ESE)	Continuous Internal Assessment (CIA)	Exam Hrs.	Credits
PMIT401	Data Warehousing and Data Mining	04	70	30	03	4
PMIT402 PMIT403	**Elective Paper-I** Artificial Intelligence and Expert Systems Information Protection and Security	04	70	30	03	4
PMIT404 PMIT405	**Elective Paper-II** Open Source Operating System Mobile Application Development	04	70	30	03	4
	Practical /Project					
PMIT451 PMIT452	Linux Lab Mobile Application Lab	04	60	40	04	3
PMIT453	Project(Project, Report, Viva)	08	120	80	04	6
	Total	**24**	**390**	**210**	**17**	**21**

M.Sc. – IT First Semester

PMIT101: Programming Fundamentals

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks:40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit-I

Problem Solving with Computers: Algorithms, and Flowcharts.

Basic Structure of C Programs: Creating, Compiling, Linking and Execution of a C program. Header Files, C Tokens (Keywords, Identifiers, Constants, Special symbols, operators), Variable declaration and Data types, Operators, Expressions, Managing Data Input and Output Operations. Decision Making and Branching, Looping and Jumping Statements.

Unit-II

Arrays: Declaration, Definition, Multidimensional Arrays, Character Arrays and Strings.

Functions: Definition, Need for Functions, User-Defined and Standard Functions, Function Calls, Function Calls, Category of Functions, Types of Parameters, Recursion, Storage Class Specifiers

Unit-III

Structures and Unions: Array of Structures, Nesting of Structures.

Pointers: Declaration, Definition and Use of Pointers, Pointers and Structures.

Unit-IV

File Management in C: Creating, Opening and Closing a File, I/O Operations on Files, Command Line Arguments. Dynamic Memory Allocation, Pre-Processor.

Recommended Books

1. Kerighan & Richie The C programming language (PHI Publication)
2. Byron Gottorfried Schaum's outline of programming with C
3. E.Balaguruswamy Programming in ansi 'C' (Tata McGraw Hill)
4. Kanetkar "Let Us C", BPB Publications. (Tata McGraw Hill)

PMIT102: Database Management System

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks:40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit-I

Introduction to Database Concepts: Database and Need for DBMS ,Characteristics of DBMS, Database Users, 3-tier architecture,(its advantages over 2- tier) Data Models, Views of data-schemes and instances, Independence, Data modeling using the Entity-Relationship approach, Entities, Relationships, Representation of entities, attributes, relationship set, Generalization , Aggregation.
Relational model: Overview of database models, Relational Model, Structure of relational database, different types of keys, Expressing M:N relation, relational algebra, Constraints.

Unit-II

Relational Database Design: Functional dependencies, Normalization Normal forms based on primary keys (1 NF, 2 NF, 3 NF, BCNF, 4 NF, 5 NF) Lossless joins and dependency preserving decomposition.
SQL: Introduction to SQL, SQL Data types and Literals, Types of SQL commands, SQL Operators and their procedures, Tables, Views and Indexes, queries and sub-queries, aggregate function, insert, delete and update operations, Joins, Unions, Intersections, Minus in SQL.
Query Processing: Query Processing Stages, Estimation of Query Processing Cost.

Unit-III

Transaction Processing: Concept and definition of transaction, ACID properties, states of transaction, serializibility,
Concurrency Control: Concurrency Control, Lock Based Protocols, Two Phase Locking protocol, Timestamp-based Protocol, multiple granularity, Deadlock Handling, Deadlock Prevention, Deadlock Detection and Recovery.
Recovery: Failure classification, recovery concepts, database backup, recovery concepts based on deferred update and on immediate update. Shadow paging, check points.

Unit-IV

Distributed Database: Homogeneous and Heterogeneous databases, Architecture and design of distributed databases, Distributed data storage, Data fragmentation, horizontal, vertical and hybrid fragmentation
Client/Server database: Evolution of client concept, Client/Server environment, characterization of Client/Server computing. Functions of clients server, application partitioning, the two-layer and three-layer architectures, communication between clients and servers.

Recommended Books

1. Fundamental of Database Systems by R. Elmasri; S. Navate; Benjamin Cummings;
2. Introduction to database systems by C. J .Date
3. Database system concept by Korth
4. Principles of Database Management by James Martin
5. Relational database design for Micro computers Application by Prentice Hall (Jackson)
6. Database Management Systems by Bipin Desai

PMIT103: Discrete Mathematics (From Session 2014-15 onwards)

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks:40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit-I

Number Systems: natural numbers, integers, rational numbers, real numbers, complex numbers, arithmetic modulo a positive integer (binary, octal, decimal and hexadecimal number systems), floating point notation.
Binary Arithmetic: 2's complement arithmetic, conversion of numbers form one of binary/ octal/ decimal /hexadecimal number system to other number systems, Codes (Natural BCD, Excess-3, Gray, Octal, Hexadecimal, Alphanumeric- EBCDIC and ASCII), Excess-3, Gray, Octal, Hexadecimal, Alphanumeric- EBCDIC AND ASCII), Error Codes.

Unit-II

Logic and Proofs: Proposition, Conjunction, Disnunction, Negation, Compound proposition, Conditional propositions (Hypothesis, conclusion, necessary and sufficient condition) and Logical equivalence, De Morgan's law, quantifiers, universally quantified statement, generalized De Morgan's Laws for Logic, component of Mathematical system (axiom, definitions, undefined terms, theorem, leema and corollary), proffs (direct proffs, indirect proffs, proof by contra-positie), valid argument, deductive reasoning, modus ponens (rules of inference), universal instantiation, universal generalization, existential instantiation, universal generalization resolution, principle of mathematical induction, structural induction.

Unit-III

Sets, Venn diagrams: ordered pairs, sequences and strings, relation (reflexive, symmetric, anti-symmetric, transitive, partial order), inverse relation and composition of relations, relational database, functions (injecftive, suvjective, bijective), conposition of functions, equivalence relations interpretation using digraphs, cardinals.

Unit-IV

Graph: Graph theory undirected graph, digraph, weighted graph, similarity graphs, paths and cycles, Hamiltonian cycles, shortest path algorithm. isomorphism of graphs, planar graphs.
Trees: characterization of trees, spanning trees, breadth first search and death first search method, minimal spanning trees, binary trees, traversals.

Recommended books:

1. C.l.Liu ; elements of Discrete Mathematics Tata McGraw Hill publishing Company Ltd., 2000
2. Richard johnsonbaugh disvrete mathematics prearson Asia 2001 .
3. John Truss : Discrete Mathematics for Computer Scientists, Pearson Education, Asia, 2001.
4. Robert J.McEliece : Introduction to Discrete Mathematics, Tata Mc. Graw Hill, India.
5. Lipschutz : Discrete Mathematics, Tata Mc. Graw Hill India.
6. Kenneth H. Rosen, Discrete mathematics and Applications, Tata Mc. Graw Hill, India.

PMIT104: Computer Architecture

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks:40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit -I

Introduction to Digital Computer: Overview of the Digital Computer System (Processor, Memory, Input and Output Devices, Storage Devices, Representation of Data: Digital versus Analog, Digital number system (binary, octal, decimal and hexadecimal numbers,) conversion from one form to another, fractional numbers and signed numbers, 1'S, 2'S Complements, Fixed point and floating point representations, Boolean algebra (addition, subtraction, multiplication and division), Logic Gates (NOT, OR, AND, NAND, NOR, XOR, XNOR) types Codes (ASCII, EBCDIC, Unicode) Combinational Circuits(Multiplexer, Demultiplexer, coder, Encoder)Sequential Circuits(Flip flops, registers, Counters).

Unit-II

Anatomy of a Computer: Mother Board (Special reference to Intel 810 Chipset motherboard), CISC Micro Processors (Special reference to Pentium, AMD, Cyrix), RISC, types of RAM, Flash, Cache, types of memory modules (SIMM, DIMM), System clock, Bus (Data, Address, Control), Expansion slots (ISA, MCA, EISA, PCI, AGP).

Unit-III

I\O and Storage Devices: Input devices, Output devices, Printers (Dot-Matrix, Line, Label, Ink-Jet, Laser, Color Laser, thermal wax, dye sublimation, fiely, IRIS), Plotters (Pen, Ink-jet, electrostatic), Voice output], Storage devices I Storage types (Magnetic, Optical, Magneto-optical, Solid state), random versus sequential access, formatting, tracks and sectors, speed, storage capacity, Floppy Disk (5.25 inch, 3.5 inch; 2HD, zip, Superdisk, HiFD) Hard Disk (tracks, cylinders, sectors; Hard Drive Interfaces (IDE, EIDE, Fast SCSI, Fast/wide SCSI, Uitra SCSI; Hard Disk Cartridges, RAID), Optical Disks [pits and lands, CD-ROM, R, RW, DVD-ROM, R, RAM)], Magnetic tape (reels, streamers, DAT,DLT, stripe, Smart card), Modem (Fax/Data/Voice).

Unit-IV

Computer Memory Systems: Architecture of Digital Computer, Processor Design Principles, Control Unit Design: Conventional and Micro programmed, Input- Output System. Memory and I/O Organization: Interfacing with CPU; Main Memory, Auxiliary Memory, Cache Memories, Associative Memory and Virtual Memory. I/O Interfacing with CPU; Addressing Data Transfer Techniques.

Recommended Books

1. Computer Architecture And Organization: Mcgraw Hill, 2nd Edition, John Hyaes.
2. Computer System Architecture: PHI, 3rd Edition, M.Morries Mano.
3. Computer Organization And Design: Prentice Hall Of India, Chaudhari P.P.
4. Perspective In Computer Architecture: Prentice Hall Of India, Rao P.V.S.
5. Computer System Architecture: Prentice Hall, Tannenbaum A.
6. Parallel Computer Architecture: A Hardware/Software Approach by David Culler

PMIT105: Operating System

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks:40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit-I

Introduction to Operating System: Types of software (System/Application),Translators (Interpreters/ Compilers), Operating system as a resource manager, Operating system need and services, Classification and Evolution of OS, Hierarchical/Layered Organization of OS.

Unit-II

Process Management: Process concept, Process Control Block, Process Life cycle, Type of Scheduler, Scheduling criteria, multiple processor scheduling, scheduling Algorithm, FCFS, SJF, Priority and round robin scheduling, critical section, semaphores. Asynchronous parallel process, multithreading at system/user level, Inter process communication, Process Synchronization & Deadlock, Monitors, Deadlock prevention & avoidance, Deadlock Detection and deadlock Recovery.

Unit-III

Memory Management: Memory Management Techniques; Single partition allocation, multiple partition allocation, Swapping, paging and segmentation, segmented-paged memory management techniques; logical and physical address space; address mapping. Demand paging, Virtual memory, protection and address mapping hardware, page fault, Page replacement and page removal algorithms.

Unit-IV

Device Management and I/O Programming: Disk structure, disk scheduling, access method and storage capacity; sharable and non sharable devices and their management.

Information Management & File System: File organization and access methods, logical and physical file structure; physical file system realized with device management function; file allocation methods, linked and index allocation, logical file implemented on physical file system. File protection and security, Directory structure, single level, two level, tree structure, Free Space Management, Allocation Methods.

Recommended Books

1. James L. Peterson & A. Silberschatz: Operating System Concepts; 2nd Edn., Addison Wesley, World Student Edition
2. Andrew S. Tenenbaum : Modern Operating Systems; Prentice Hall, India
3. Dietel H.M.: An Introduction To Operating Systems; Addison Wesley, World Student Edition
4. Systems Programming & Operating Systems, 2nd Edn., Tata Mc Graw Hill

PMIT151: 'C' Programming Lab
Examination: Practical
Exercises to be framed so as to cover the topics and tools covered in theory paper.

PMIT152: DBMS Lab
Examination: Practical
Exercises to be framed so as to cover the topics and tools covered in theory paper.

PMIT153: Office Management Lab
Examination: Practical
Exercises to be framed so as to cover the topics and tools covered in theory paper.

M.Sc. – IT Second Semester

PMIT201: Object Oriented Programming Concepts

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks:40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit-I

Need of Object Oriented Programming: Advantages of OOP, Comparison of Functional Programming and OOP Approach, Essentials of OOP (Objects, classes, Encapsulation, Data abstraction, Inheritance, Reusability, Polymorphism, Delegation, Message Communication).
C++ Basics: Preprocessors, Comments, Data types, Operators, Expressions, Loops and Decisions, Arrays and String handling, Modular Programming with Functions, Structure and Unions.

Unit-II

Class and Objects: Dynamic memory allocation, Storage class specifiers. Classes, Member functions, Objects, Arrays of objects, Pointers and Classes, Nested classes, Constructors, Destructors, Inline member functions, Friend Functions, Static member function.
Inheritance: Inheritance, Type of Inheritance, types of base classes.

Unit-III

Polymorphism: Function Overloading, Operator overloading, polymorphism, Unary and Binary Operator Overloading, Overload Assignment Operator, Copy Constructor, Data Conversion between Objects of different classes,
Pointers and Run time binding Virtual function, late binding, pure virtual functions, Abstract classes, Generic Programming with Templates.

Unit-IV

Stream Computation with Console, Stream Computation with Files, opening and closing of files, stream state member functions, binary file operations, structures and file operations, classes and file operations, random access file processing.
Exception handling: Exception handling mechanism, Throwing mechanism, Catching mechanism.

Recommended Books

1. Herbert Schildt; C++ : The Complete Reference; 4th Edn; TMH, 2003.
2. Robert Lafore; Object Oriented Programming in C++; 4th Edition; Techmedia
3. Balagurusamy E.; Object Oriented Programming C++; 4th Edition; TMH, 2009.
4. Venugopal, Rajkumar; Mastering C++; Tata Mcgrow Hill, 2006.
5. Kanetkar Y.; LET US C++; BPB; 2009.

PMIT202: Data Structure and Algorithms

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks:40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit I

Algorithm: Basic concepts and notation, Understanding the Problem, Pseudo code and Flowchart, efficiency of algorithms, complexity measures, Time and space complexity, Arrays, String and string manipulation function.

Unit-II

Linked List, Stacks, array representation of stacks, arithmetic expressions, Polish notations, Recursion, Queues, dequeues, priority queues. Applications of Stacks and Queues. Hashing techniques.

Unit –III

Trees: Basic concepts, linked representation, representation in continuous memory. Binary trees, Binary Search tree, insertion and deletion in binary search tree, traversing algorithms, using stacks, header nodes, threads.

Graph: Graphs and their representations, sequential representation- Adjacent matrix, linked representation of graphs, traversing a graph. DFS and BFS algorithms.

Unit-IV

Sorting and Searching: Use various data structures for searching and sorting, Internal and external sorting techniques, Binary search, Hash tables & Hashed searching, Bubble sort, Insertion sort, Selection sort, Merge sort, Radix sort, Quick sort, Heap structures, heap sort algorithm.

Recommended Books

1. S. Lipschutz: Data Structures;Mc Graw Hil1 International Edition, 2008.
2. A.V. Aho., J.E. Hopcroft, and J.D. Ullman, Data Structures and Algorithms, 3rd Edition; Pearson Education Asia, 2008.
3. Salaria R.S.; Data Structure and Algorithms Using C/C++; 4th Edition; Khanna.
4. Patel R.B.; Expert Data Structures with C; 2nd Edition; Khanna.
5. R. Johnsonbaugh, Discrete Mathematics, Pearson education Asia
6. Jean-Paul Tremblay and Paul G. Sorenson, An Introduction to Data structures with applications, TMH Publishing Co. Ltd.
7. D.P.Friedman, M. Wand and CT Haynes, Essentials of Programming Languages, Prentice Hall of India, 2008.
8. Gottfried B.; Programming with C : Schaum Outlines; Tata Mc Graw Hil1 Edition.
9. Balagurusamy E.; Programming in ANSI C ;Fifth Edn; Mc Graw Hill,2011.
10. Kanetkar Y.; LET US C; X Edition; BPB,2010.

PMIT203: Web Designing and Development

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks: 40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit-I

The Internet: history of the world wide web, hardware and software trend, Web Server, Web Client.
Introduction of HTML: Introduction, markup language, editing HTML: common tags, hyperlinking, images, formatting text, horizontal rules, types of lists, HTML tables, HTML forms, more complex HTML forms, Frames, Image maps.

Unit-II

Dynamic HTML: CSS : introduction, inline styles, creating style sheets with the style element, conflicting styles, linking external style sheets, positioning elements, backgrounds, element dimensions, text flow and the box model, user style sheets, Filters and Transitions.

Unit-III

Java Script: introduction to scripting, decision making. Java script control structures, array declaring and allocating arrays, Array Library Functions, Java script functions, Event Handling.
DOM: Introduction, Window, History, Navigator, Form, Frames, Location Objects.

Unit-IV

PHP: Introduction to PHP, Advantages of PHP, Data types, Operators, Control Statements, Array, Function, Forms Handling, Database Connectivity.

Recommended Books

1. M.L. Young: Complete Reference b: Internet; 2nd Edition; Tata Mc Graw Hill, 2006.
2. Thomas A. Powel ; Web Design : C.R.; Second Edition; TMH, 2009.
3. Thomas A. Powel ; HTML & XHTML : C.R.; Fourth Edition; TMH, 2008.
4. Harely Hahn: The Internet, Tata Mc Graw Hill.
5. G. Robertson: Hands on HTML, BPB Publications.
6. D.A. Tauber, B. Kienan: Microsoft From Page ; BPB Publications.
7. PHP The Complete Reference, Steven Holzer, Tata McGraw Hill

PMIT204: Management Information System

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks: 40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit –I

Introduction to systems and Basic systems concepts: Types of systems, The systems Approach, Information systems: Definition and characteristics, types of Information, role of Information in Decision – Making, Sub – systems of information systems: EDP and MIS, management levels, EDP/MIS/DSS.

Introduction to MIS: Meaning and role of MIS, Definition of MIS, Systems approach to MIS, MIS organization within a company. Effectiveness and efficiency criteria. Overview of system analysis and design, feasibility analysis, design, implementation, testing and evaluation. Introduction to Systems Development Life Cycle and its phases.

Unit-II

MIS Planning: MIS structure and components, MIS features, Problem and Derivation of MIS plans, Prioritization and developmental strategies.

Conceptual Design of MIS: Definition of the problem, System objectives and system constraints. Analysis of information source. Alternative system design and selection of optimal system. Conceptual system design document.

Unit-III

Detailed System Design and Implementation : Application of basic system design concepts to MIS, Involvement of end-user and role of MIS department and System Analyst, Role of Top Management during design an implementation. Management and control of MIS function.

Unit-IV

Advanced MIS System Concept and Controls: Transaction processing systems, Office automation systems, Decision Support System, Executive information system, AI and Expert systems. Pitfalls in MIS Planning, Designing and Implementation. MIS in Operation : MIS for Accounting and Finance Function, MIS for Personnel Systems, MIS for Marketing Systems, Production & Inventory system.

Recommended Books

1. Murdick R.G. Ross J.E. & Claggett J.R. : Information System for Modern Management, 3rd Edn., PHI, 2009.
2. Jawadekar W.S; MIS; Third Edition, TMH,2008.
3. Prasad ML; Prasad Usha; MIS; First edition;Sultan Chand & Sons,2007.
4. Awad Elias M.: System Analysis and Design; 2nd edition; Galgotia Pub., 2004.
5. James A.O Brien : Management Information Systems, Galgotia Pubn..
6. Wigarders K., Svensson A., Sehong L.: Structured Analysis & Design of Information Systems,Mcgraw-Hill Book Co..
7. Locus: Anlaysis, Design and Implementation of Information System, 3rd Edn., McGraw-Hill Book Co.
8. Newman: Designing Integrated Systems for the Office Environment, McGraw-Hill Company.

PMIT205: Data Communication and Networking

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks: 40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit-I

Data Communication Concepts: Introduction, Communication System, Communication mode, Data encoding: Analog and Digital data, digital and analog signal, Communication Channels, Synchronous and asynchronous transmission. Bandwidth concepts, channel capacity.

Introduction to Networking: Computer network, Characteristic & advantages of networking, types of network, LAN, MAN, WAN.

Unit-II

Transmission media & Network Topologies: Guided & Unguided media, Twisted pair, coaxial cable, Fiber optics, Radio. VHF and microwaves, Satellite link. Network topology, bus, star, ring, tree, mesh & hybrid topology. Advantages and disadvantages of these topology. Multiplexing Channels and Concept of multi channeling and modulation, pulse code modulation (PCM) Frequency Division multiplexing, Time Division multiplexing, CODECS. Digital Data Communication Techniques: Asynchronous and Synchronous Transmission - Types of Errors, Error Detection and error Correction methodologies.

Unit-III

Network Standards: Introduction, Layered approach, OSI model functions & responsibilities of each layer. Physical, Data link Layer, The Medium Access sublayer, Network, Transport and Application Layer, Introduction to TCP/IP Model.

Unit-IV

Internetworking: Principles of internetworking, Connectivity Devices, Switches, Bridges, Routers, Routing with bridges. Internet and e-mail protocols: SMTP, SLIP, POP, PPP, FTP, HTTP, Wifi Network, Bluetooth, Broadband, Leased line connection.

Recommended Books

1. Introduction to Digital and Data Communications, Michal A Miller, JAICO pub.
2. Data and Computer Communication – Willam Staling, PHI pub.
3. Data Communication & Network – Forouzan (TMH)
4. Computer Networks – A. Tanenbaum, (PHI pub.)
5. Internetworking with TCP/IP Vol-I – Comer (PHI pub.)
6. Data Communications and distributed Networks-V.B, Black, (Prentice Hall pub.)

PMIT251: C++ Programming Lab
Examination: Practical
Exercises to be framed so as to cover the topics and tools covered in theory paper

PMIT252: Data Structure Lab
Examination: Practical
Exercises to be framed so as to cover the topics and tools covered in theory paper

PMIT253: Web Designing Lab
Examination: Practical
Exercises to be framed so as to cover the topics and tools covered in theory paper

M.Sc. – IT Third Semester

PMIT301: .Net Technologies

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks:40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit -I

Introduction to .NET: Concept and Features, Microsoft Intermediate Language, Meta Data, .net name spaces, Common Language Runtime, Common Type System, Common Language Specification, .Net Applications. Introduction to C# Programming with respect to ASP.NET.

Unit- II

Basics of ASP. NET: Creating and deploying ASP .NET applications, Web forms, Web controls, working with events, Rich web controls, Custom web controls, Validation controls, Debugging, Deploying projects with Business objects.

Unit- III

Introduction to web services: Web services Infrastructure, Web Services: Building, Deploying, publishing, Finding, Consuming.

Unit -IV

Basics of ADO .NET: ADO Objects, (Data Table – Data Views – Data Set, Data Adapter), ADO .NET Providers(OLEDB and SQL Providers). Introduction to XML.

Recommended Books

1. Herbert Schildt, The Complete Reference C# 3.0, Tata McGraw-Hill
2. ASP.NET 4 Unleashed by Stephen Walther, Kevin Scott Hoffman, Sams Publishing
3. Bill Evjen, Professional ASP.NET 3.5 in C# and VB, Wrox Publication
4. Kogent Solutions, C# 2008 Programming covers. NET 3.5 (Black Book), Dreamtech Press.

PMIT302: Java Programming

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks: 40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit – I

Introduction to Java: history, characteristics, Object oriented programming, data types, variables, Operators and Expressions, Type casting and conversion, Control Statement: (selection, iteration, jump statement), arrays.

Introduction to class and objects: class fundamentals, Access specifies, constructor, methods, inheritance, creating multilevel hierarchy, Constructor call orders, Issues with super, method over riding, Wrapper classes.

Unit – II

Packages and interfaces: Basics of Interfaces, Use of Interfaces, final, abstract, transient, static, volatile, Package creation, Use of packages.

Exception handling: Exception raising & handling, Exception classes, Throwing exceptions, Try - catch - finally, Exception Propagation. Runtime Exceptions, User defined Exceptions.

Threading in Java: Fundamentals of Multi-threading Java coding with Thread classes, thread Management in Java, Using Runnable interface, Thread Synchronization, Inter thread communication.

Applets: Introduction to Applet coding, Applet life cycle, Graphics facility, Color and Font, Passing parameters to applets.

Unit – III

Java Library: string handing, string buffer, java.lang, java.io

AWT based effective GUI in Java: Detailed overview of AWT classes, Graphics primitives and UI Components, Layout features, Standalone GUI applications, Layout Managers, Implementations of event driven mechanism, Delegation of even model, Listeners and Adapters,

Unit – IV

JDBC : JDBC Drivers, Two Tier and Three Tier client server model, Setting up a connection to database, Creating and executing SQL statements, Resultset and Resultset MetaData Object.

Recommended Books

1. V. Daniel Liang, Introduction to Java Programming, PHI.
2. Patrick Naught on, Java Complete Reference, Tata McGraw Hill.
3. The Java Handbook, Patrick Naught on, Tata McGraw Hill.
4. Introduction to Java programming, E Balagurusamy, PHI.
5. Programming Java, Decker & Hartsfield, Vikas Publications.

PMIT303: Computer Graphics

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks:40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit-I

Introduction of Computer Graphics: Definition, Application areas of Computer graphics, Graphical user Interface, Random and Raster scan displays, CRT monitors, Flat panel displays (Plasma Panels, Liquid crystal displays, Electroluminescent displays). Color Models(RGB, CMYK, HSV, Lookup tables, color map tables etc.)

Unit- II

Raster graphics Algorithms : Line drawing algorithms (DDA, Bresenham;s algorithm), Circle and ellipse drawing algorithms. Filling (Scan-converting Polygon filling, Inside outside tests boundary fill, flood fill and area fill algorithms).

Transformation and Projection: 2-D transformations (Translation, Scaling, Rotation, Reflection, Shearing), Homogeneous coordinate representation, 3-D Transformations, Projection classification, Parallel projections, Perspective projections(One point, Two point).

Unit-III

Two dimensional Clipping and visible surface detection methods : Viewing pipeline, window and viewport, Sutherland Cohen Sub division algorithm, Cyrus-beck Algorithm, classification of visible surface detection algorithm, Backface algorithm, Depth sorting method, Subdivision methods etc.

Curves and Surfaces : Hermit Curves, Benzier Curves, B-Spline Curves, Properties and Continuity Concepts.

Unit –IV

Image processing: File formats, Basic digital techniques like convolutions the holding and histogram manipulations, Image enhancement, Geometric manipulation, the automatic identification and extraction of objects of interest.

Multimedia : Hardware, Software, Media(Text, Images Cameras, Scanners, formats), Audio(Digital Audio, Music, MIDI wave Files), Video(Compression, Digital Video MPEG), Graphics Animation (Tweaking, Morphing Motion Specification)

Recommended Books :

1. Hearn D., Baker P.D. ; Computer Graphics ; 2nd edition; Pearson 2003
2. Foley J.D.; Van D.A.; Fundamentals of Interactive Computer Graphics.
3. RongerD.F.; Elements of Computer Graphics.

PMIT304: E-Commerce Application Development

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks: 40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit-I

Introduction to E-Commerce: Definition of e-Commerce, objectives, advantages, disadvantages, scope of e-commerce, Traditional Commerce V/s E-Commerce.

Unit-II

E-Commerce Models: Business to consumer, Business to Business, Consumer to Consumer, Other models-Brokerage Model, Aggregator Model, Info-Mediary Model, Community model, Value chain model, Supply Chain Model.

Unit-III

Framework for Electronic Data Interchange: Definition of EDI, Types of EDI, EDI standards, EDI Security and Privacy Issues, EDI Implementation, Format of EDI, Electronic-Catalogs, Digital Libraries.

Network Security: Network Security and Firewalls, Client Server Network, Security Threats, Cyber Law, E-mail.

Unit-IV

E-Payment System: Types of Electronic Payment Systems, E-Cash, E- Cheque, Smart Cards, Credit Card, Debit Card, E-Purse, Payment Gateways.

Recommended Books

1. Davis Whiteley: E-Commerece, TataMcHill, Delhi
2. P. T. Joseph: E-Commerece, Addis Anwesley, Delhi
3. R. Kalakola and A.B. Whiston : Frontiers of Electronic Commerce; Addision Wisley , 1996
4. Greensein, Feinman : Electronic Commerce Security, Risk management and Control; TMH, 2000
5. Saily Chan: Electronic Commerce Managment; John Wisley; 1998.
6. David kosiur ; Understanding E-commerce , The cutting edge of business, Tata-McGraw Hill
7. Kamlesh K. Bajaj & Debjani Nag, E-Commerce, The cutting edge of business, Tata-MCGraw Hill
8. Pete Losuin and A.Murphy, Electronic Commerce, A Jaico Book
9. Green Stein "Electronic Commerce", TMH.

PMIT305: Software Engineering and Testing

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks:40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit-I

Software Engineering Fundamentals: Definition of Software, Software Engineering, Software Development Life Cycle, Process Models: Definition, Water Fall Model, Incremental Process Models [Incremental Model, RAD Model], Evolutionary Process Models [Prototyping, Spiral Model, Concurrent Development Model], Specialized Process Models, Specialized Process Models [Component-Based Development Model, Formal Methods Model]

Unit-II

Project Management: Concepts, Software Process and Project Metrics; Software Project Estimation: Project Planning, Software Scope and Resources. Software Project Estimation, Decomposition Techniques. Empirical Estimation Models: COCOMO Model, Software Equation. Project Scheduling and Tracking.

Unit-III

Software Requirements and Analysis: Requirement Engineering Tasks, Requirement Analysis, Analysis Modeling Approaches: Data Modeling, Flow-Oriented Modeling, Object Oriented Analysis.

System Design: Design Concepts, Design Models: Data Design, Architectural Design, Interface Design and Component-Level Design.

Unit-IV

Software Testing: Software Testing Fundamentals, Testing Strategies: Unit Testing, Integration Testing, Validation Testing, System Testing. Testing Approaches: Black-Box Testing and White-Box Testing. Difference between Black Box Testing and White Box Testing Approaches.

Software Quality Assurance: Quality Concepts, Software Quality Assurance, Software Reliability.

Advance Topics in Software Engineering: Computer Aided Software Testing Tools, Software Reengineering.

Recommended Books

1. Software Engineering – A Practitioners Approach Roger S. Pressman, 3rd /4th Edition, Mcgraw Hill, International Education.
2. An Integrated Approach To S/w Engineering, Pankaj Jolote, 1st / 2nd Edition, Narosa.
3. Software Engineering – A Programming Approach, D. Belie I. Moray, J. Rough, PHI.
4. Software Testing Techniques, Barrios Bier, 2nd Edition, Van N Ostrand Reinhold.

PMIT351: .Net Lab
Examination : Practical
Exercises to be framed so as to cover the topics and tools covered in theory paper.

PMIT352: Java Lab
Examination : Practical
Exercises to be framed so as to cover the topics and tools covered in theory paper.

PMIT353: Computer Graphics Lab
Examination : Practical
Exercises to be framed so as to cover the topics and tools covered in theory paper.

M.Sc – IT Fourth Semester

PMIT401: Data Warehousing and Data Mining

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks:40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit – I

Introduction to Data Warehouse: Data warehouse uses, Data Warehouse Planning stages and Designing approaches. Delivery Process-Data Warehouse Delivery Methods. System Processes; data in Flow Process, Extract and load process, Clean and transform Process, Backup and Archive process and Query Management Process. Process Architecture - Load manager, Warehouse manager, Query manager.

Unit – II

Database Schema: Star flake schema, Identifying facts and dimensions, Designing fact tables and dimension tables, Design Star flake schema, Multi-dimension schemas. Horizontal and vertical partitioning, Hardware partitioning. Aggregations and summary table, Data Marts, Designing Data Marts. Metadata transformation and load Managers.

Hardware Architecture: Process, Server, Network and Client hardware. Contents of data warehouse database, Database structures and layout and file systems. OLAP function and tools, OLAP Servers, ROLAP, MOLAP.

Unit – III

Security: Security requirements, impact of security on design and performance, Backup strategies and disaster recovery. Service agreement and operations of Warehouse. Capacity Planning (Process Estimate load), Tuning the data warehouse (Aggregate performance, data load and queries). Testing data warehouse-Develop test plan Testing backup recovery, Testing operational environment, testing database, testing of the application. Data warehouse futures.

Unit – IV

Data Mining: Data mining concepts, business, technical and social context for data mining, data mining interface, data mining approaches, data mining methodologies, data preprocessing, data cleaning, data reduction, data transformation, technologies used for data mining, cluster analysis, portioning method, outlier detection, mining association rules in large databases.

Recommended Books

1. Data mining & warehousing [concepts and techniques] : Saumya Bajpai.
2. Data mining concepts & techniques : jia wei han, micheline kamber, jian pei.
3. Sam Anahory, Dennis Murray, "Data Warehousing", Pearson Education pub.
4. Michel A. Berry, Gordon S. Linoff, " Mastering Data Mining", Wiley Publishing.
5. Mallach G, Fredn E, "Decision Support System and Data Warehouse Sustems", TMH
6. John Poole, Dan Chang, Dauglas Talbert,"Common Warehourse Metadata Developer's Guide", Wiley pub.

PMIT402 Elective Paper I: Artificial Intelligence and Expert Systems

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks:40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit – I

Concept of intelligence, Artificial intelligence, definition turning test, areas of application. Search techniques, state space, Production rules, problem characteristics. Production system characteristic, depth first, breadth first search methods.

Unit – II

Heuristic search method, generate and test, hill climbing, best first method, graph search, AND OR search methods, constraint satisfaction, backtracking. Introduction to list and string processing, concept of knowledge, Logic, prepositional and predicate calculus, resolution.

Unit – III

Semiatics nets, frames, conceptual dependency, scripts, Monotonic reasoning, logical reasoning induction, default reasoning, minimalist reasoning, statistical reasoning, Baye's theorem, certainty factors, dempster shafer theory, Fuzzy logic.

Unit – IV

Concept of learning, Knowledge acquisition, rote learning, discovery, analogy.
Concept of expert system, need for an expert system, Component and categories of an expert system, Stages in the development of an expert system.

Recommended Books

1. Elaine rich & Kevin Knight: Artificial Intelligence and Expert System, PHI.
2. Charniak, E.: Introduction of Artificial Intelligence, Narosa Publishing House.
3. Winton. P.H. : LISP, Narosa Publishing House.
4. Marcellus: Expert System Programming in TURBO PROLOG Prentice-Hall Inc. 1989.
5. Clark, K. L. & McCabe, F.G.: Micro-Prolog Prentice-Hall Inc. 1987.

PMIT403 Elective Paper I: Information Protection and Security

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks:40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit – I

Introduction to Cryptography and Security: Attacks, Services & Mechanisms, Security, Attacks, Security Services. Conventional Encryption: Classical Techniques, Conventional Encryption Model, and Steganography, Classical Encryption Techniques.
Modern Techniques: Simplified DES, Block Cipher Principles, DES Standard, DES Strength.

Unit – II

Conventional Encryption Algorithms: Triples DES, Blowfish, International Data Encryption Algorithm, RCS, CAST-128, RC2 Placement & Encryption Function, Key Distribution, Random Number Generation, Placement Of Encryption Function.
Public Key Encryption: Public-Key Cryptography: Principles of Public-Key Cryptosystems, RSA Algorithm, Key Management, Fermat's & Euler's Theorem, Primality, The Chinese Remainder Theorem.

Unit – III

Hash Functions: Message Authentication & Hash Functions: Authentication Requirements, Authentication Functions, Message Authentication Codes, Hash Functions, Birthday Attacks, Security Of Hash Function & MACS, MD5 Message Digest Algorithm, Secure Hash Algorithm (SHA), Digital Signatures: Digital Signatures, Authentication Protocol, Digital Signature Standard (DSS).

Unit – IV

Network & System Security: Authentication Applications: Kerberos X.509, Directory Authentication Service, Electronic Mail Security, Pretty Good Privacy (PGP), S / Mime, Security: Architecture, Authentication Header, Encapsulating Security Payloads, Combining Security Associations, Key Management, Web Security: Secure Socket Layer & Transport Layer Security, Secure Electronic Transaction (Set), System Security: Intruders, Viruses, Firewall Design Principles, Trusted Systems.

Recommended Books

1. Kaufman, c., Perlman, R., and Speciner, M., Network Security, Private Communication in a public world, 2nd ed., Prentice Hall.
2. Stallings, W.,. Cryptography and Network Security: Principles and Practice, 3rd ed., Prentice Hall PTR.
3. Pieprzyk Josef and et.al; Fundamentals of Computer Security, Springer-Verlag, 2008.
4. Trappe & Washington, Introduction to Cryptography, 2nd Ed. Pearson.
5. Johannes A. Buchmann, "Introduction to cryptography", Springer- Verlag.

PMIT404 Elective Paper-II: Open Source Operating System

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks:40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit – I

Introduction to open source system software, Linux Architecture (Kernel & shell), Linux file system (inode, Super block, Mounting and Unmounting), Essential Commands (cal, date, echo, printf, bc, script, mailx, passwd, who, uname, tty, sty, man), File and Directory types, Managing Files (pwd, cd, mkdir, rmdir,).

Unit – II

Handling ordinary Files, Basic File Attributes (Ownership and Access Permissions of files and directories). Process Management in Linux, Signal Handling, System call. I/O Redirection and Piping. Simple Filters (pr, head, tail, cut, paste, sort, uniq, tr), Filters using Regular Expressions (grep, sed).

Unit – III

Introduction to Shell, Types of Shell, Editors(basics of vi), Shell Programming-Shell scripts, Shell control statements, Variables, if-then-else, case-switch, While, Until, For, Set and Shift, Trap, Find, string handling, Shell Metacharacters, Shell Scripts, Shell keywords, Built in Commands, Shell Procedures and Reporting, Handling documents.

Unit – IV

System Administration– root, administrator privilages, security, Booting and Shutting down, managing disk space, device files, Advanced System Administration (partitions and file system, fdisk, mkfs, mounting and unmounting filesystems)

Recommended Books

1.Linux: The Complete Reference, Sixth Edition by Richard Petersen
2.A Practical Guide to Linux Commands, Editors, and Shell Programming (3rd Edition) by Mark G. Sobell (Author)
3. Your UNIX/Linux: The Ultimate Guide by Sumitabha Das

PMIT405 Elective Paper-II: Mobile Application Development

Max Marks: 100 (ESE: 70 CIA: 30) *Passing marks:40*

Question Paper pattern for End Semester Exam (ESE)

Max Marks: 70

Part-A will contain 12 very short questions of 1 mark each (attempt any 10).
Part-B will contain 4 questions (1 from each unit) of 5 marks.
Part-C will contain 4 questions (1 from each unit with internal choice) of 10 marks.

Unit – I

Introduction to Android: History of Mobile Software Development, The Open Handset Alliance, The Android Platform, Android SDK, Building a sample Android application.

Unit – II

Android Application Design Essentials: Anatomy of an Android applications, Android terminologies, Application Context, Activities, Services, Intents, Receiving and Broadcasting Intents**,** Android Manifest File and its common settings, Using Intent Filter, Permissions, Managing Application resources in a hierarchy, Working with different types of resources.

Unit – III

Android User Interface Design Essentials: User Interface Screen elements, Designing User Interfaces with Layouts, Drawing and Working with Animation.

Unit – IV

Using Common Android APIs: Using Android Data and Storage APIs, Managing data using SQLite, Sharing Data Between Applications with Content Providers, Using Android, Networking APIs, Using Android Web APIs, Using Android Telephony APIs.

Recommended Books

1. Lauren Darcey and Shane Conder, "Android Wireless Application Development", Pearson Education, 2nd ed. (2011)
2. Reto Meier, "Professional Android 2 Application Development", Wiley India Pvt Ltd (2011)
3. Mark L Murphy, "Beginning Android", Wiley India Pvt Ltd(2009)
4. Sayed Y Hashimi and Satya Komatineni, "Pro Android", Wiley India Pvt Ltd(2009)

Student should select either PMIT 451 or PMIT 452 as per their electives.

PMIT451: Linux Lab
Examination : Practical
Exercises to be framed so as to cover the topics and tools covered in theory paper.

PMIT452: Mobile Application Lab
Examination : Practical
Exercises to be framed so as to cover the topics and tools covered in theory paper.

PMIT453: Project(Project, Report, Viva)
Two typed and duly bound copies of project report shall be submitted at least 3 weeks before commencement of the Theory/Practical examination which ever commences earlier.

General instructions about preparation of training report

1. The Power Point Presentation has to be prepared for the project report.
2. The Power Point Presentation will be around 10-15 mins, and then question answers. So prepare the number of slides accordingly.
3. The binding for reports will be spiral binding.
4. The format for the reports should be adhered with exactly.
5. The Coding of the Project should not be included in the report.
6. Contents of Index page should include the following parts:
    a. Project Requirements.
    b. Feasibility Study.
    c. Detailed Designing:
    d. List of Figures.
    e. List of DFD.
    f. List of ER-Diagram.
    g. List of Tables.
    i. Testing.
    j. Future Scope.

Page Format of Project Report should be as follows.
Paper: A4
Font: Times New Roman, Bookman Old Style
Chapter Heading: 16pt, Sub heading: 14pt.
Running Matter: 12 pt
All topics will be numbered accordingly.
Paragraph Gap: 6 Pt Maximum
Line Gap: 1.5
Margins: Left 1.5, Right, Top and Bottom 1 inch

Please Note: Project report of live project in the given format has to be prepared in 3 sets. These reports should have CD containing the soft copy and Power Point Presentation of Project report.

Format of Front Page of Project Report.

Project Report

Submitted to the S. S. Jain Subodh P.G.(Autonomous) College,

University of Rajasthan, Jaipur

Logo of college **UOR logo**

in Partial fulfillment of the requirement for the degree of

MASTER OF SCIENCE (INFORMATION TECHNOLOGY)

Submitted by
(your name)

Name of Internal Guide

Name of Training Incharge (from the company, where you have undergone training)

MSc-IT (Academic Session)

(month of deposition and year)

Format of Live Training Certificate on company letter head

CERTIFICATE

This is to certify that "**your name, S/D/O---------- "** is/was under training from …… (start date) to …. (end date) in my supervision for partial fulfillment of the requirement for the award of the Degree of Master of Science (Information Technology).

During this period he /she has worked on…….(description of training) project as ---------.
I wish for his/her good future.

Date: **Name of Training Incharge**

Designation