TEACHING AND EXAMINATION SCHEME FOR

M. SC. INFORMATION TECHNOLOGY – PREVIOUS
(2010-2011)

Paper Name (Theory)	Lec	Tut	Exam Hours	Max Marks	
				Sess Marks	Exam marks
MIT – 101 Computer Organization	3	1	3	20	80
MIT – 102 Data Structures and Algorithm	3	1	3	20	80
MIT – 103 Relational Database Management Systems	3	1	3	20	80
MIT – 104 Discrete Mathematical Structures	3	1	3	20	80
MIT – 105 Programming in Visual Basic	3	1	3	20	80
MIT – 106 Web Technology	3	1	3	20	80
MIT – 107 Data Communication & Networks	3	1	3	20	80
MIT – 108 Data Ware-housing & Data Mining	3	1	3	20	80
Total of Theory					**800**

Paper Name (Practical)	Pract Hours	Pract Exam	Min Marks	Max Marks
MIT – 109 Programming Lab – 1 ('C' and Data Structures)	3	3	20	50
MIT – 110 Programming Lab – 2 (SQL Programming)	3	3	20	50
MIT – 111 Programming Lab – 3 (Visual Basic & .NET)	3	3	20	50
MIT – 112 Programming Lab – 4 (HTML, FrontPage, JavaScript)	3	3	20	50
Total of Practical				200
Grand Total (Theory + Practical)				**1000**

The question paper will be divided into 3 parts:

Part A:

1. 10 Question of 1 mark each
2. Answer should not exceed more than 20 words
3. All questions are compulsory

Part B:

1. 5 Questions of 2 marks each
2. Answer should not exceed more than 50 words
3. All questions are compulsory

Part C:

1. 3 Questions of 20 marks each. There will be an internal choice in each question.
2. Answer should not exceed 400 words
3. All questions are compulsory.

Note:

1. **Lec:** Lectures **Tut:** Tutorials per week per hour
2. There will be sessional (internal assessment) of 20 marks conducted by the college
3. Two Practical exams shall be conducted by one internal and one external examiner of a batch of 20 students in day.
4. **Project Work:** 6 hours per student

The Project Report work shall be assessed by one internal and one external examiner only of a batch of 20 students in a day. The project work should not be done in a group. Each student shall be allotted one project and one copy should be submitted to the University.

5. Duration of Practical exam is 3 hours.
6. A Laboratory Exercise File should be prepared by each student for each practical paper and should be submitted during practical examinations.
7. Practical of 50 marks distribution is as under:
    a. 30 marks for practical examination exercise for 3 questions
    b. 10 marks for Viva-voce
    c. 10 marks for Laboratory Exercise File
8. Eligibility: Graduate from any discipline with 50% marks in aggregate. As regards admission on reserved category seats government rules will be applicable

Scheme of Examination
(For M. Sc. Computer Science/Information Technology)

Reg. 17 (a)

The examination for the M. Sc. Computer Science/Information Technology will consist of (a) Theory papers (b) Laboratory / Practical work and project work. Candidates will be required to pursue a regular, full time course of study at the University department and the affiliated colleges for a period of two academic years in order to be eligible for appearing in the examination.

1. Eligibility for M. Sc. Computer Science/Information Technology: 50% marks in any graduation scheme.
2. Examination:
    i. There shall be 25 papers (16 theory, 8 practical in each year and 1 project as practical in the final year) of 2100 marks (previous and final year). Theory paper shall be of 3 hours duration having 100 marks. Out of 100 marks 20 marks shall be considered as internal assessment based on internal test and seminars and 80 marks will be of examination determined by the University. The practical shall be of 50 marks assessed by external examiner and the project work shall be of 100 marks based on project presentation and viva-voce, assessed by external examiner.
    ii. For passing a candidate shall have to secure at least 40% marks in each course (theory paper, sessional and practical work separately) and 50% marks in the aggregate in all the courses.
    iii. Due paper(s) will be applicable if a candidate obtains 50% marks in aggregate and fails in not more than three (3) papers (theory). Due paper(s) will be held along with the examination of the next year. The chance of due paper(s) will be given only 2 times.
    iv. Wherever a candidate appears at for a due paper examination he/she will do so according to the syllabus in force.
    v. A candidate not appearing at any examination/absent in any paper of term end examination shall be deemed as fail.

3. A candidate for a pass in the examination shall be required to obtain:
    i. At least 50% marks in the aggregate of all the papers prescribed for the examination and
    ii. At least 50% marks in the practical(s) wherever prescribed at the examination, provided that if a candidate fails to secure at least 40% marks in each individual paper at the examination notwithstanding his having obtained the minimum percentage of marks required in the aggregate for that examination.

    No Division will be awarded in the Previous Year examinations. Division shall be awarded at the end of the Final Year Examination on the combined marks obtained at the previous and final examinations taken together as noted below:

Passed with First Division	60% of the aggregate marks taken together of previous and final examinations
Passed with second division	48%

    Provided that if a candidate clears any paper after a continuous period of two years since he/she was admitted to the M. Sc. Computer Science/Information Technology then for the passing marks, i.e. 40% marks, shall be taken into account in the case of such course(s).

    Provided further that in case where a candidate requires more than 40% marks in order to reach the requisite minimum aggregate as many marks, out of those actually secured by him/her will be taken into account as would enable him/her to make up the deficiency in the requisite minimum aggregate marks.

4. Candidates reappearing at an examination in a subsequent year shall be examined in accordance with the scheme and syllabi in force and shall be entitled to the award of the degree of year in which they clear the last failing/unclear paper.

MIT – 101 COMPUTER ORGANIZATION

Number system, Logic Gates, Boolean Algebra, K-Map, combinational circuit, flip-flop, sequential circuit, encoder, decoder, multi-plexer, shift register, fixed-point representation, floating-point representation.

Register transfer language, inter-register transfer, arithmetic micro operation, logic and shift micro operation, instruction codes, timing and control, input/output and interrupts.

Processor bus organization, arithmetic logic unit, stack organization, instruction format, addressing mode, data transfer and manipulation, program control, control memory, addressing sequence, micro program sequencer, micro instruction formats.

Addition subtraction algorithm, multiplication algorithm, division algorithm, input-output interface, direct memory access, 8257 DMA controller, priority interrupts, input-output processor, Programmable interface devices, parallel communication, 8255 programmable peripheral interface.

Block diagram of 8085 and pin configuration, 8086/8088 instruction set, data transfer instructions, arithmetic, logical, shift, rotate, flag, compare, jump instruction, subroutine, loop, addressing modes, memory hierarchy, associative memory, memory addressing, virtual memory, cache memory, cache coherence.

Reference Books:

1. Computer Architecture and Organization, Hayes, Tata McGraw Hill
2. Computer Architecture and Logic Design, Thomas C, Tata McGraw Hill
3. Computer System Architecture, M. Morris Mano, PHI
4. Digital computer, M. Morris Mano, PHI
5. Computer Architecture, William Sterling

MIT – 102 DATA STRUCTURES AND ALGORITHM

Basic concepts and notation of Algorithm, Understanding the Problem, Pseudo code and Flowchart, efficiency of algorithms, complexity measures, basic time analysis of an algorithm,

C Language: Types, Operators and Expressions, variable names, data types and sizes, constants, declarations, operator, expressions and type conversions.

Control flow: Statements and blocks, selection and loops structures, break, continue, branching and labels.

Functions and program structure: Basics, functions and their arguments, external variables and static variables, scope rules, register variables, block structures, initialization, recursion.

Pointers and Arrays: Pointers and addresses, pointers and function arguments, pointers and arrays, address arithmetic, character pointers and functions, multi-dimensional arrays, pointers arrays, pointer to functions, 2D string and string functions.

Structures: Basics, structures and functions, arrays of structures, pointers to structures, table look up fields, typedef, file

Single linked lists, double linked list, circular list, sparse table, stack, queue, list, prefix, postfix, infix, sorting, insertion, selection, bubble, algorithm of quick, merge, radix,.

Searching, binary, linear, tree, Binary Tree, tree traversal, breadth – first, depth – first, , in-order, pre-order, post-order graph, BFS, DFS, algorithm of Kruskal, prim.

Reference Books

1. A. V. Aho, J. E. Hoperoft, and J. D. Ullman, Data Structures and Algorithms, Pearson Education Asia.
2. R. Johnsonbaugh, Discrete Mathematics, Pearson Education Asia
3. Sara Baase & Allen Van Gelder – Computer Algorithms, Pearson Education Asia.
4. Jean- Paul Tremblay and Paul G. Sorenson, An Introduction to Data Structures with Applications, TMH Publishing Co. Ltd.
5. Programming in C, Gottfried, Tata McGraw
6. Programming in C, E. Balagurusamy, PHI.
7. C Programming R.B. Patil, Khanna Publication

MIT – 103 RELATIONAL DATABASE MANAGEMENT SYSTEMS

Object of database systems, data abstraction, data definition language, data manipulation language, database administrator database model, database system architecture. Entity relationship model, entities and entity sets their relationship, mapping constraints, generalization, aggregation, use of ER model for the design of databases, sequential, random, index sequential file organization, relational algebra, normalization up to DKNF.

Object Oriented modeling, class, different types of attributes, generalization, inheritance, aggregation, encapsulation, distributed database design, architecture of distributed processing system, data communication concept, data placement, placement of DDBMS, and other components, concurrency control techniques, recovery, transaction management, need of recovery, recovery techniques, serializability, two-phase locking.

Query optimization and processing, algorithm for external sorting, select and join, object and set operations, heuristics in query optimization, temporal database concept, multi-media database, data-mining, association rule, classification, application, data-warehousing, need, architecture, characteristics, data layer, XML tree data model, document, DTD schema, query, database, data-warehousing verses view

Security and integrity of databases, security specifications in SQL, access control, flow control, encryption of public key infrastructure, cryptography and types.SQL*PLUS Data types, Constraints, Operators, DDL, DML, PL/SQL syntax, Data types, PL/SQL functions, Error handling in PL/SQL, package functions, package procedures, Oracle transactions. Stored procedures & functions, creation and execution of procedures, triggers

Reference Books:

1. Database Management System, Korth, Tata McGraw Hill.
2. Data Base System Concept, C. J. Date
3. Data Base Management System , Navathe, Pearson Education Asia
4. SQL Complete Reference, Leon and Leon, Tata McGraw Hill
5. Oracle Developers Guide, Muller, Tata McGraw Hill
6. SQL, PL/SQL Programming Language, Ivan Bayross, BPB Publications

MIT – 104 DISCRETE MATHEMATICAL STRUCTURES

Law of formal logic, connectivity, propositions, conditional statements, WFF, tautology, contradiction, logical equivalence, law of logic, duality, logical implications, normal forms, sets, sub-sets, finite and infinite sets, universal, power, disjoint sets, property of sets, union, intersection sets, distributive, compliment and property of compliment, Venn diagram, difference, cartisan product set.

Relation property, irreflexive, asymmetric, compatible universal complimentary relation, equivalence class, coordinate diagram, transitivity extension, closure, matrix representation and digraph, functions, mapping, composition of functions, associative mapping, inverse mapping, characteristic functions, recursions, linear recursion relation, non-homogeneous relations,

Partial ordering, total order set, dual order, Hasse Diagram, Lexicographic ordering, least and greatest element, minimal and maximal element, upper and lower bound, Well-Order set, operations, Well-ordering theorem, Lattices, property, bounded lattices, direct product, Boolean algebra, homomorphism, minimization function, gates, Boolean algebra and applications.

Basic of counting, permutation combination, circular permutation, power set, basic identities, partition and cross partition, pigeonhole principle, Pascal triangle, binomial theorem, n-Ary operation, semi group, homomorphism and isomorphism of semi groups, monoid, Addition, multiplication Modulo m & p, property and postulates of group, cosets.

Graph, definition, incidence and degree, order of graph, adjacency matrix, linked representation, circuit path, sub-graph, removal and addition of vertex and edge, operation of graph, complement and connect of graph, cycle, path, wheel, bipartite graph, isomorphism, forest and operation, tree, spanning tree, rooted tree, binary tree, height balance binary tree, planar graph, Eulers graph and Hamiltonian graph, digraph.

Reference Books:

1. Discrete Mathematical structures, Kolman, Busby & Ross, PHI
2. Discrete Mathematics for Computer Scientists and Mathematicians, Baker, PHI
3. Discrete Mathematics with Graph Theory, Goodaire & Paramenter, PHI
4. Discrete Mathematics, Lieu and Lieu.

MIT – 105 PROGRAMMING IN VISUAL BASIC

Introduction: Need of Visual languages, Integrated Development Environment (IDE), Advantage of Visual BASIC, Characteristics and features of Visual BASIC, Characteristics and features of Visual BASIC- IDE, Projects, User Interface, Objects oriented, Visual Development and Event-Driven Programming, Forms/Graphic controls, Data processing, sharing with Windows and Internet applications.

Visual BASIC Programming and Tools: An Introduction of Visual BASIC Programming, simple program construction, Statements, Input/Outputs, Comments, Editor, Subroutines, Control Flow Statements, Objects, and variants.

Designing User Interface- Elements of User Interface, Under-Standing Forms, Menus and Toolbars, Designing Menus and Tool-bars, Building Dynamic Forms, Drag- and-Drop Operations, working with menus, customizing the toolbars

Controls: Textbox, Combo box, Scrollbar and Slider Controls Operations. Generating Timed Events. Drawing with Visual Basic using Graphics, controls, Coordinate systems and Graphic methods Manipulating Colors and Pixels with Visual Basic Database Programming with Visual Basic-Data access methods, Creating, reading and writing text files. Data controls, creating Queries.

Structure of VB.Net, data type, operator, constant, arrays, control statements, loops, advance features of VB.net, collection, interface, events, delegates, overloading, attributes, database connectivity with VB.Net using ADO.Net

Reference Books:

1. Programming with Visual Basic 6.0, Mohammed Azam, Vikas Publications
2. Visual Basic Programming, Dietel & Dietel, Pearson Education

MIT – 106 WEB TECHNOLOGY

Internet – current state, hardware and software requirement, ISP, an internet account, web home page, URL, browser, security on web, searching tools, search engines, FTP, Gopher, Telnet, emails. Electronic Commerce Framework, Electronic and Media Convergence, Traditional vs. Electronic Business Applications, Overview of Mobile Computing Technology, Mobile Data Internet and Mobile Computing Applications

Networks-Security and Firewalls - Client Server Network Security Threads, Firewalls and Network Security, Data Message Security, Encrypted Documents and Electronic mail.

JavaScript, comment types, JavaScript reserved words, identifiers, events, primitive data types, escape sequences, data type conversion functions and methods, operators, control structures and statements objects, applet fundamentals, applet life cycle, local and remote applet applications, tags, creating and passing parameters to applets, exception handling.

Build HTML documents from scratch. View HTML document using a variety of Web Browsers Organize information using Lists Use HTML frames and tables for page layout. Connect to a variety of resources by using hypertext links Create style sheets to format the look and feel of the pages. Understand key image theory concepts. Create new images from scans or from scratch Optimize image sizes.

Create animated gifs and transparent images be able to create graphical elements for use on web pages: buttons banners navigation bars, background tiles. Embed images and other multimedia. Post information to HITTP server. Evaluate a document design for effectiveness, usability and efficiency.

Using DHTML create functionalities like animation, stages-based presentations, splash pages, pull-down menus, drop down means, drag drop techniques. Integrating JavaScript with HTML and DHTML

References Books:

1. Elizabeth Castro, HTML 4, Pearson Education Asia.
2. D.S. Rayand E.J. Ray., Mastering HTML 4, Sybex Computer Books Inc.
3. Jeff Rule, DHTML, Tata Mc Graw Hill
4. Joseph Schmuller, Dynamic HTML, Sybex Computer Books Inc.
5. Jason J Manger, JavaScript essentials, Osborne Mc Graw Hill.
6. Joel Sarkar, Principal of Web Design, Thomson Learning
7. R.Kalakola and A.B. Whiston : Frintiers of Electronic Commerce; Addison Wisley, 1996.
8. Soka:From EDI to E-Commerce; McGraw Hill, 1995.

MIT – 107 DATA COMMUNICATIONS AND NETWORKS

Introduction to Data communications and networking, protocols, standards and architecture, topology, transmission mode, OSI model, analog and digital signals, periodic and aperiodic signals, time and frequency domain, Fourier analysis concept.

Encoding digital to digital conversion, analog to digital conversion, digital to analog conversion, analog to analog conversion, transmission of digital data, DTE-DCE interface, EIA-232, EIA-449, X.21, modem, cable modem, guided and unguided, transmission media

Multiplexing, TDM, FDM, WDM, DSL, HDLC, error classification, types of errors, error detection, error correction, virtual redundancy check, longitudinal redundancy check, cyclic redundancy check.

Asynchronous transfer mode, protocol architecture, ATM cells, ATM layers, switches, circuit switching network and concepts, routing, packet switching, X.25, virtual circuit approach, point-to-point layers, link control protocol, network control protocol.

Reference:

1. Data and Computer communications, William Stallings, PHI
2. Data communication and networking, Behoruz A. Forouzan
3. Data communication and networking, A S Godbole, Tata McGrawhill
4. Network concepts and Architecture, Hancock, BPB Publications
5. Data Communication and Networking, Tannenbaum, PHI

MIT – 108 DATA WAREHOUSING AND MINING

Data Warehousing: 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.

Database Schema - Star flake schema, Identifying facts and dimensions, Designing fact tables and dimension tables, Designing Star flake schema Multi-dimension schemas Horizontal and vertical partitioning, Hardware partitioning.

Aggregations and aggregation summary tables, Data Marts, Designing data Marts Metadata - Data transformation and load, Data management, Query generation, Metadata and tools Data Warehouse Process and Load Managers

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 environmental, testing database, testing of the application, Data warehouse futures

Data Mining: Data Mining concepts, Business, Technical and Social context for Data mining. Data Mining approaches, Data mining methodologies. Data mining techniques (Automatic cluster detection, Decision tree), Building good effective models, Working with model set, Multiple models, Case studies of data mining mode for an online bank Wireless communication corporation

References Books:

1. Sam Anahory, Dennis Murray, "Data Warehousing", Pearson Education Pub.
2. Michael A. Berry,Gordon S.Linoff,"Mastering Data Mining",Wiley Publishing.
3. Mallach G.Fredn E,"Decision Support System and Data Warehouse Systems", TMH.
4. John Poole, Dan Chang, Douglas Talbert, "Common Warehouse Metadata Developer's Guide", Wiley Pub.