TEACHING AND EXAMINATION SCHEME
M. Sc. Information Technology
W.E.F. 2018 - 2019
Semester I

	Paper Name (Theory)	Lec	Tut	Exam Hours	MAX MARKS	
					Sess-ional	Sem Exam
mit-101	Open Source Technology & Operating Systems	3	1	3	20	80
mit-102	C Programming with Data Structures	3	1	3	20	80
mit-103	Relational Database Management Systems	3	1	3	20	80
mit-104	Algorithms	3	1	3	20	80
	Total of Theory (Sessional + Semester Exam Marks)					**400**

	Paper Name (Practical)	Pract Hours	Exam Hours	Min Marks	Max Marks
mit-105	Programming Lab - 1 (C & Data Structures)	3	3	20	50
mit-106	Programming Lab - 2 (SQL Programming, Open Source)	3	3	20	50
	Total of Practical Marks				**100**
	Total of Theory & Practical Marks				**500**

TEACHING AND EXAMINATION SCHEME

M. Sc. Information Technology

Semester II

	Paper Name (Theory)	Lec	Tut	Exam Hours	MAX MARKS	
					Sess-ional	Sem Exam
mit-201	Programming in .NET with C#	3	1	3	20	80
mit-202	Web Technology	3	1	3	20	80
mit-203	Data Communications & Networks	3	1	3	20	80
mit-204	Object Oriented Concept & C++	3	1	3	20	80
	Total of Sessional & Semester Exam Marks					**400**

	Paper Name (Practical)	Pract Hours	Exam Hours	Min Marks	Max Marks
mit-205	Programming Lab - 3 (.NET & C#)	3	3	20	50
mit-206	Programming Lab - 4 (Web Technology, C++)	3	3	20	50
	Total of Practical Marks				**100**
	Total of Theory & Practical Marks				**500**

TEACHING AND EXAMINATION SCHEME
M. Sc. Information Technology
(2019-20)
Semester III

	Paper Name (Theory)	Lec	Tut	Exam Hours	MAX MARKS	
					Sess-ional	Sem Exam
mit-301	Date Warehousing & Data Mining	5	1	3	20	80
mit-302	Artificial Intelligence	5	1	3	20	80
mit-303	Programming in Python	5	1	3	20	80
mit-304	Software Engineering & Project Management	5	1	3	20	80
	Total of Sessional & Semester Exam Marks					**400**

	Paper Name (Practical)	Pract Hours	Exam Hours	Min Marks	Max Marks
mit-305	Programmng Lab -5 (Software Engg, Data Mining)	3	3	20	50
mit-306	Programmng Lab - 6 (Python & AI)	3	3	20	50
	Total of Practical Marks				**100**
	Total of Theory & Practical Marks				**500**

TEACHING AND EXAMINATION SCHEME

M. Sc. Information Technology

Semester IV

	Paper Name (Theory)	Lec	Tut	Exam Hours	MAX MARKS	
					Sess-ional	Sem Exam
mit-401	Programming in Java	5	1	3	20	80
mit-402	Soft Computing	5	1	3	20	80
mit-403	Information & Network Security	5	1	3	20	80
mit-404	Software Testing & Quality Assurance	5	1	3	20	80
	Total of Sessional & Semester Exam Marks					**400**

	Paper Name (Practical)	Pract Hours	Exam Hours	Min Marks	Max Marks
mit-405	Programmng Lab -7 (Soft Computing)	3	3	20	50
mit-406	Programmng Lab - 8 (Java, Exploring Internet)	3	3	20	50
mit-407	Projects	6	3	40	100
	Total of Practical Marks				**200**
	Total of Theory & Practical Marks				**600**

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

The question paper will be divided into 3 parts:

Part A:

1. 10 Question of 3 mark each – 30 marks
2. Answer should not exceed more than 50 words
3. All questions are compulsory

Part B:

1. 5 Questions of 5 marks each – 25 marks
2. Answer should not exceed more than 100 words
3. All questions are compulsory

Part C:

1. 3 Questions of 15 marks each – 45 marks.
   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. One Practical exam 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
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 4 semesters. The examination shall 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 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 (4 theory, 2 practical in each semester and 1 project as practical in the fourth semester) of 2100 marks (first to fourth semester). 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 at the end of each semester as 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. To pass a semester a candidate shall have to score 25% marks in each subject (theory and practical) separately and also 36% marks in aggregate of all the papers prescribed for the examination.
    iii. Due paper(s) will be applicable if a candidate obtains 36% marks in aggregate and fails in not more than two (2) papers (theory). Due paper(s) of first semester will be held along with the third semester and the due paper(s) of second semester will be held along with the fourth semester. The third and fourth semester due paper(s) will be held in the first and second semester respectively of the next year. The chance of due paper(s) will be given only thrice in each semester.
    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 36% marks in the aggregate of all the papers prescribed for the examination and
    ii. At least 36% marks in the practical(s) wherever prescribed at the examination, provided that if a candidate fails to secure at least 25% 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 first, second and third semester examinations. Division shall be awarded at the end of the fourth semester Examination on the combined marks obtained at the first, second third and fourth semester taken together as noted below:

Passed with First Division	60% of the aggregate marks taken together of all the four semester examinations
Passed with second division	48%

All the rest will be declared to have passed the examination.

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. 25% marks, shall be taken into account in the case of such course(s).

4. The grace marks shall be given up to 1% of the total aggregate marks of theory and practical of that semester in maximum one paper.
5. 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.

Duration: 3 hours	Max Marks: 80

mit-101Open Source Technology & Operating Systems

Introduction to Operating Systems, goals of OS, operation of OS, resource allocater and related functions, classes of OS, batch processing, multi-processing, time sharing, distributed, real time systems, system calls, system programs, structure of OS, layer design of DOS, Unix, virtual machine OS, kernel based OS, micro-kernel based OS, architecture of Window 2000.

Process concept, interacting process, threads, fundamental of scheduling, scheduling criteria, long medium short term scheduling, scheduling algorithms , structure of concurrent system, critical section, critical region, inter-process communication, monitor and semaphores, implementation and uses.

Logical versus physical address, swapping, contiguous allocation, segmentation, paging, segmentation with paging, kernel memory allocation, page replacement algorithm, virtual memory, virtual memory with paging, demand paging, dead lock, characterization, methods for handling dead locks, prevention, avoidance, thrashing, allocation of frame, virtual memory using segmentation,

Architecture of Distributed system, inter-process communication protocol, network OS, issues in distributed design, issues of distributed file system, network structure, distributed system structure, file system, coordination.

History of Linux, Linux architecture, Linux file System, file naming, types of files, directory command, file command, vi editor, locating files in Linux, filter pipe, shell variables, local and global variables, command substitution, if, while, for, shift, tar, basic networking commands in Linux.

Duration: 3 hours	Max Marks: 80

mit-102C Programming with Data Structures

Overview of C Language: History of C, Character set, C tokens, Identifiers, Keywords,Data types, Variables, Constants, Symbolic Constants , Operators in C, Hierarchy ofOperators, Expressions, Type Conversions and Library Functions.

Managing Input and Output Operation: Formatted and Unformatted I/O Functions,Decision making, branching and looping: Decision Making Statements - if Statement, if–else statement, nesting of if-else statements, else–if ladder, switch statement,?operator

Looping - while, do-while, for loop, Nested loop, break, continue, and goto statements.Functions: Function Definition, prototyping, types of functions, passing arguments tofunctions, Nested Functions, Recursive functions.

Arrays: Declaring and Initializing, One Dimensional Arrays, Two Dimensional Arrays,Multi-Dimensional Arrays - Passing arrays to functions. Strings: Declaring andInitializing strings, Operations on strings, Arrays of strings, passing strings to functions.Storage Classes - Automatic, External, Static and Register Variables.

Structures-Declaring and Initializing, Nested structure, Array of Structure, PassingStructures to functions, Unions, typedef, enum, Bit fields. Pointers – Declarations,Pointer arithmetic, Pointers and functions, Call by value, Call by reference, Pointers andArrays, Arrays of Pointers, Pointers and Structures. Meaning of static and dynamicmemory allocation, Memory allocation functions,

Stack, single linked list, double linked list, circular linked list, prefix, postfix, infix, queue, d-queue Merge sort, quick sort, Binary tree,representation,traversing,threaded binary tree,binary search tree,insertion, deletion into a binary search tree, Heap sort

Graph,representation of Graph,shortest path, operation on Graphs,traversing a Graph,topological sorting,files

Duration: 3 hours	Max Marks: 80

mit-103Relational 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

Duration: 3 hours	Max Marks: 80

mit-104Algorithms

Definitions of Data Structure and Algorithm – Time and Space complexity- Algorithm notations.

Time Space Tradeoff Asymptotic notations, properties of asymptotic notations, recurrence equations, solving recurrence equations using substitution method and Master's method

Brute force and greedy algorithms, Divide and Conquer Strategy: Merge sort, quick sort, integer multiplication, matrix multiplication, exponentiation problem, convex hull problem, dynamic programming

Knapsack Problem, Job sequencing with dead line optimal merge pattern, single source shortest path, minimum cost spanning tree

Complexity theory: Decidability of problems: Halting problem, NP-class of problem, P class of problem, NP=P question, Polynomial reduction problem, Cook's theorem, NP hardness and NP completeness.

Binary tree- Representation – Traversing – Threaded Binary tree- Binary Search tree- Insertion deletion into a binary search tree- Heap sort

Graph- Representation of Graph- Shortest path – Operation on Graphs- Traversing a Graph- Topological Sorting – Files

Duration: 3 hours	Max Marks: 80

mit-201Programming in .NET with C#

Introduction to .NET, .NET Framework features & architecture, CLR, Common Type System, MSIL, Assemblies and class libraries. Introduction to visual studio, Project basics, types of project in .Net, IDE of VB.NET- Menu bar, Toolbar, Solution Explorer, Toolbox, Properties Window, Form Designer, Output Window, Object Browser. The environment: Editor tab, format tab, general tab, docking tab. visual development.

Variables -Declaring variables, Data Types, Forcing variables declarations, Scope & lifetime of a variable, Control flow statements: conditional statement, loop statement. Constants, Arrays, types of arrays, Collections.

Subroutines, Functions, Passing variable number of arguments, Optional Arguments, Returning value from function, Msgbox&Inputbox.Class, overloading, constructor, inheritance, overriding, interfaces

Working with Forms : Loading, showing and hiding forms, controlling one form within another.Textbox, Label, Button, Listbox, Combobox, Checkbox,PictureBox, RadioButton, Panel, scroll bar, Timer, ListView, TreeView, toolbar, StatusBar.. OpenFileDialog, SaveFileDialog, FontDialog, ColorDialog, PrintDialog.LinkLabel.Designingmenus :ContextMenu, access &shorcut keys.

Database programming with ADO.NET – Overview of ADO, from ADO to ADO.NET, Accessing Data using Server Explorer. Creating Connection, Command, Data Adapter and Data Set with OLEDB and SQLDB. Display Data on data bound controls, display data on data grid.Generating reports using CrystalReportViewer

Introduction to C#, variables, constants, identifiers, data types, expressions and operators, flow control and exception handling, control structures, properties, indexes, namespace, classes, objects, structures

Object oriented programming C#, pointers, delegates and events

Duration: 3 hours	Max Marks: 80

mit-202Web 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, TFTP

Web browser architecture, web page and multimedia, static dynamic and active web page, simple mail transfer protocol, simple network management protocol, hypertext transfer protocol

Basics of PHP: Introduction to PHP, what does PHP do? ,history of PHP , language basics ,data types , variables , expressions and operators , flow control statements , including code , embedding PHP in web pages.

Functions & Strings: Calling a function, defining a function, variable scope, function parameters, return values, variable functions, anonymous functions. Strings: Accessing individual characters, cleaning strings, encoding and escaping, comparing strings, manipulating and searching strings, regular expressions.

Arrays & Objects: Indexed vs. associative arrays, identifying elements of an array, storing data in arrays, multidimensional arrays, extracting multiple values, converting between arrays and variables, traversing arrays, sorting. Objects: Creating an object, accessing properties and methods, declaring a class, introspection.

MySQL Overview: Introduction, connecting to and disconnecting from the server , Entering queries , Creating and using a database , Creating and selecting a database , creating a table , loading data into a table , Retrieving information from a table , selecting all data , selecting particular rows , selecting particular columns , sorting rows , date calculations , working with NULL values , pattern matching , counting rows , using more than one tables.

MySQL databases in PHP: Introduction, connecting to a MySQL database, querying the database, Retrieving and displaying the results, modifying data, deleting data.

JavaScript - JavaScript Introduction , Variable, If-Else, Switch, Operators, Popups, Functions,Iterator functions, Loops, Forms, Events, and Event Handling, Try-Catch, Introduction to JavaScript Objects, JS Built-in Objects:Array,String , Date , window, document, navigator, status, history, location. Event handling, DOM, dynamically adding, removing and replacing DOM

Duration: 3 hours	Max Marks: 80

mit-203Data Communications & 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

Duration: 3 hours	Max Marks: 80

mit-204 Object Oriented Concepts & C++

Object Oriented Concepts, Tokens, Expressions and Control Structures Introduction: Basic Elements of Programming, Console I/O Operations.

Control Structures: Control and Looping Statements. Function: Function Prototyping, Call and Return by Reference, Inline Function, Default and Const Arguments, Function Overloading, Arrays, Manipulators and Enumeration.

Classes and Object, Object Oriented Methodology: Basic Concepts/Characteristics of OOP. Advantages and Application of OOP's, Procedural Programming Vs OOP

Classes and Objects: Specifying a Class, Creating Objects, Private & Public Data Members and Member Functions, Defining Inline Member Functions, Static Data Members and Member Functions. Arrays within Class, Arrays of Objects, Objects as Function Arguments, Returning Objects.

Constructors, Destructors, Operators Overloading and Inheritance. Constructors and Destructors: Introduction, Parameterized Constructors, Multiple Constructors in A Class, Constructors With Default Arguments, Dynamic Initialization of Objects, Copy Constructors, Dynamic Constructors, Const Objects, Destructors Operators Overloading: Definition, Unary and Binary Overloading, Rules for Operator Overloading.

Inheritance: Defining Derived Classes, Types of Inheritance, Constructors and Destructors in Derived Classes.

Pointers Virtual & Friend functions and file handling Pointers: Pointer to Objects, this Pointer, New and Delete Operators, Virtual Function, Friend Functions. Opening, Closing a File, File Modes, File Pointers and their Manipulation, Sequential Input and Output Operations: Updating a File, Random Access, and Error Handling During File Operations, Command Line Arguments.

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

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

Duration: 3 hours	Max Marks: 80

mit-301Data Warehousing & Data Mining

Data Warehouse:
Store, warehouses, mart, data warehouse architecture layer topologies, meta-data key and action of metadata, implementing the data warehouse, data warehouse technologies, Role and structure of data warehouse, cost of warehousing data, function of data warehouse

Data Mining:
Introduction to data mining, DM techniques, issues and challenges in Dm, Applications, association rules, Prior, Partition, Pincer-Search, Dynamic Itemset counting, FP-tree growth, Incremental, Boder Algorithm

Clustering Techniques, portioning, k-Medoid algorithm, Hierarchical, categorical clustering algorithm, Decision tree, best split, splitting indices and criteria, decision tree construction algorithm, CART, ID3, C4.5, CHAID, Decision tree construction with presorting, rain Forest, approximate methods, Boat, Pruning Technique

Duration: 3 hours	Max Marks: 80

mit-302 Artificial Intelligence

Definition of AI, Application of AI, knowledge-based system, representation of knowledge, organization, manipulation and acquisition of knowledge,

Introduction of prolog, variable, object, domain, clauses, recursion, basic list manipulation function, predicates, input, output, local variable, iteration, recursion, arrays, database in prolog, rule order, goal order, cut, trial, prolog query.

Syntax, semantics of propositional logic, syntax and semantics of FOPL, conversion to clausal form, inference rule, resolution principles, non-deductive inference methods, representation using rules, truth maintenance system, predicate completion and circumscription, modal and temporal logics, fuzzy logic,

Bayesian probabilistic inference, possible word representations, Dempster-Shafer Theory, Ad-Hoc methods, Heuristic reasoning methods, associative networks, frame networks, search problems, uniformed or blind search, searching And-Or graph

Matching techniques, measures for matching, matching like patterns, partial matching, Fuzzy matching algorithms, indexing and retrieval techniques, integrating knowledge and memory

Expert system, rule based system architecture, non-productive system architecture dealing with uncertainty, knowledge acquisition and validation, knowledge system building tool.

Duration: 3 hours	Max Marks: 80

mit-303 Programming in Python

Programming basics and strings, numbers and operators, variables, making decisions

Functions, classes and objects, organizing programs, files and directories

Building modules, text processing,

Writing a GUI with Python, Accessing Databases

Python with XML, Network Programming, Programming with C, Numerical Programming,

Web Application and Web Services, Integrating Java with Python

Duration: 3 hours	Max Marks: 80

mit-304 Software Engineering & Project Management

Concepts of Software Engineering, Software Characteristics, components applications, software Metrics and Models; Process and Product Metrics, Size metric, Complexity metric, McCabe's Cyclometic Complexity, Halsted Theory, Function Point Analysis.

System Development Life Cycle (SDLC) Steps, Water fall model, Prototypes, Spiral model. Planning and Software Project: Cost Estimation, Project Scheduling, Quality Assurance Plans, project Monitoring Plans.

Software Development & Software Design : System design, detailed design, function oriented design, object oriented design user Interface design, Design level metrics: Phases, Process Models, Role of Management, Role of Metrics and Measurement, Software Quality factors,

Coding and Testing: Programming Practices, verification, Monitoring and Control. Testing level metrics Software quality and reliability Clean room approach, software reengineering.

Testing & Reliability: Testing Fundamentals, Test case design, Functional Testing, Structural Testing, Test Plan activities during testing, Unit System , Integration Testing. Concept of Software Reliability, Software Repair and Availability, Software Errors and Faults Reliability Models (JM, GO, MUSA Markov) Limitations of Reliability Models

Duration: 3 hours	Max Marks: 80

mit-401 Programming in Java

Introduction to Java, history, characteristics, Object Oriented Programming, data types, variables, arrays, difference between Java and C++Control statements: Selection, iteration, jump statements, operators

Classes and Methods: Introducing classes, Class fundamentals, Declaring Objects, Assigning object reference variables. Introducing method , Constructors, The this Keyword, Garbage Collection- Finalize() method, Overloading methods, Using objects as parameters, Argument Passing , Returning Objects, Recursion , static and final keyword , Nested and Inner Classes , String Class ,Command Line arguments.

Inheritance, Packages, Interfaces: Inheritance Basics , using super, method overriding , Dynamic method dispatch , abstract classes , Using final with inheritance , Packages , Access Protection , Importing packages ,Interfaces.

Exception Handling, Multithreading, Applet : Exception handling fundamentals, Types, Using try, catch, throw, throws and finally , Java thread model , Creating a Thread , Creating multiple threads ,Thread priorities , synchronization , Inter-thread communication , Applet Basics , Applet Skeleton, HTML applet tag – Passing parameters to applet

I/O Streams, Utility Classes:I/O Streams- Byte Streams , Character Streams , Reading and Writing Files , Legacy Classes and Interface: Vector, Stack, The Enumeration Interface , Utility classes: StringTokenizer, Date, Calendar,Random, Scanner

Javax.Swing Package: JButton, JLabel,JTextField, JPasswordField, JRadioButton,JCheckBox, JComboBox, JList, JToggleButton, JSpinner, JTabbedPane, JTable,JToolBar, JToolTip , JFrame, JPanel, JDialog, JSlider, Introduction to Event Handling: Event Classes – Event Listener interfaces

Duration: 3 hours	Max Marks: 80

mit-402 Soft Computing

Basic of neural Networks, inference and learning, classification of models, association of models, optimization and self-organization models, definition of learning, supervised and unsupervised learning. AI learning, neural network learning, knowledge based neural network, rule based, decision tree based, constraint based neural network.

Incremental learning, symbolic methods, neural network approaches, applications of neural networks, neural networks as mathematical models, expert system heuristic, hierarchical models, hybrid, parallel, control network discovery, symbolic methods, neural network methods.

Genetic Algorithm, evolutionary programming, classifier system, genetic programming parse tree, mathematical foundation of GA variant of GA (Hybrid and fuzzy GA enhancement of genetic programming application

Duration: 3 hours	Max Marks: 80

mit-403 Information & Network Security

Classical Encryption Techniques Symmetric Cipher Model, Cryptography, Cryptanalysis and Brute-Force Attack, Substitution Techniques, Caesar Cipher, Monoalphabetic Cipher, Playfair Cipher, Hill Cipher, Polyalphabetic Cipher, One Time Pad. Block Ciphers and the data encryption standard: Traditional block Cipher structure, stream Ciphers and block Ciphers, Motivation for the feistel Cipher structure, the feistel Cipher, The data encryption standard, DES encryption, DES decryption, nature of the DES algorithm.

Public-Key Cryptography and RSA: Principles of public-key cryptosystems, applications, requirements, cryptanalysis. The RSA algorithm, Key Management and Distribution: Symmetric key, distribution scenario, Hierarchical key control, session key lifetime, a transparent key control scheme, Decentralized key control, controlling key usage, Symmetric key distribution using asymmetric encryption, simple secret key distribution, secret key distribution with confidentiality and authentication, A hybrid scheme, distribution of public keys, public announcement of public keys, publicly available directory, public key authority, public keys certificates, X-509 certificates. Certificates, X-509 version 3, public key infrastructure, User Authentication

Wireless network security: Wireless security, Wireless network threats, Wireless network measures, mobile device security, security threats, mobile device security strategy Web Security Considerations: Web Security Threats, Web Traffic Security Approaches. Secure Sockets Layer: SSL Architecture, SSL Protocols, Transport Layer Security, Electronic Mail Security, IP Security.

Duration: 3 hours	Max Marks: 80

mit-404 Software Testing & Quality Assurance

Need for Testing—Psychology of testing—Testing economics—white box testing , Black box testing, Grey box Testing—Retesting regression Testing—Verification and Validation Testing Strategies—Levels of Testing—Unit, Integration ,System Testing, Acceptance Testing

Test case Design—Statement Coverage—Branch Coverage—Condition Coverage—Decision / Condition Coverage—Multiple Condition Coverage—Data Flow Coverage—Mutation Testing

Test Case Designs.Boundary Value analysis—Equivalence Partitioning—Cause Effect Graphing, Error Guessing, Logic Based Testing.

Special Topics: Syntax testing—Finite State Testing Logic Based Testing Domain Testing

Test Planning—Test Plan Documentation—Test Estimation—Test Schedule —Test monitoring and Control—standards for Testing.

Introduction of Object Oriented Testing—Automated Tools for Testing—Tool Selection and Implementation—Test case generators—GUI Testing—Testing Web enabled Application.