SCHEME OF EXAMINATION FOR MASTER OF COMPUTER APPLICATIONS (M.C.A.) w.e.f. Academic Session 2016-17							
5th Semester							
Paper Code	**Nomenclature of Paper**	**Exam Time (hrs.)**	**External Marks**		**Internal Marks**		**Total Marks**
			Max	**Pass**	**Max**	**Pass**	
MCA-14-51	COMPILER DESIGN	3	80	32	20	8	100
MCA-14-52	ADVANCED WEB TECHNOLOGY	3	80	32	20	8	100
MCA-14-53	LINUX AND SHELL PROGRAMMING	3	80	32	20	8	100
MCA-14-54	MOBILE APPLICATION DEVELOPMENT	3	80	32	20	8	100
MCA-14-55	ELECTIVE	3	80	32	20	8	100
MCA-14-56	S/W LAB–IX BASED ON MCA-14-52	3	100	40			100
MCA-14-57	S/W LAB–X BASED ON MCA-14-53 AND MCA-14-54	3	100	40			100
MCA-14-58	SEMINAR				20	8	20
	TOTAL		**600**	**240**	**120**	**48**	**720**
ELECTIVE: - I. THEORY OF COMPUTATION							
II. DIGITAL IMAGE PROCESSING							
III. SOFT COMPUTING							
IV. SYSTEM SIMULATION							
V. CLOUD COMPUTING							
VI. HIGH PERFORMANCE NETWORKS							
6th Semester							
MCA-14-61	PROJECT REPORT		150	60			150
	PRESENTATION AND VIVA-VOCE		150	60			150
	INTERNAL ASSESSMENT				100	40	100
	TOTAL		**300**	**120**	**100**	**40**	**400**
	GRAND TOTAL (FROM SEMESTER I TO VI)		**3300**	**1320**	**700**	**280**	**4000**

Sessional Marks in each theory paper will be awarded by the concerned teacher on the basis of marks obtained in one class test (of 10 Marks and 90 minutes duration) and evaluation of assignments (of 10 Marks).

Note: Size of Groups for all practical and viva-voce examinations should not be more than thirty.

MCA-14-51 COMPILER DESIGN

Maximum marks: 100 (External: 80, Internal: 20) **Time: 3 hours**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

Unit – I

Compilers and Translators, Need of Translators, Tools used for compilation, Structure and Phases of Compiler, Single-Pass and Multi-Pass Compilers, Bootstrapping, Compiler Construction Tools. Bootstrap compilers, Phases of Compilation process.

Lexical Analysis: Design, Finite Automata and Regular Expressions, LEX package on LINUX systems. Process of Lexical Analysis, Recognition of Regular Expressions.

Unit – II

Syntax-Directed Translation: Translation Schemes, Implementation, Postfix Notation, Parse Trees and Syntax Trees, Three-address code and representations, Flow of Control. Building Symbol Tables, Data Structures for symbol table, representing scope information.

Run Time Storage Administration: Types of Storage Allocation Schemes, Implementation of Stack Allocation Scheme and Implementation of Block Structured Languages.

Error Detection and Recovery: Errors, Lexical-Phase Errors, Syntactic Phase Errors, Semantic Errors.

Unit – III

Parsing Techniques: Top down & Bottom-up parsing, Shift Reduce parsing, Operator Precedence parsing, Predictive Parsers. Left Recursion and its removal, Recursive Descent parser, LR parsers, Canonical Collection of LR(0) and LR(1) items, SLR parsing tables, Canonical LR parsing tables, LALR parsing tables, Parsing Ambiguous Grammars, Implementation of LR parsing tables, LL(k) and LR(k) Parsers, YACC package on LINUX systems.

Unit – IV

Intermediate Code Generation: Need, Issues in the design of a code generator, Intermediate languages, Quadruples, Register Allocation and Assignment statement, peephole optimization.

Code Optimization: Principle sources of Optimization, optimization of basic blocks, Loop Optimizations, DAG Representation of Basic Blocks, Loop Invariant Computation, Reducible Flow Graphs, Global Data Flow Analysis, code improving transformation.

Text Books

1. Alfred V Aho, “Principles of Compiler Design, Narosa Publishing House.
2. Jean Paul Tremblay and Sorenson, “The Theory and Practice of Compiler Writing”, McGraw Hill.

Reference Books:

1. Dhamdhere D.M, System programming and operating system, McGraw Hill.
2. Beck L. Leland, System Software, Pearson Education.
3. Aho, Sethi, & Ullman, Compilers Principles, Techniques and Tools, Pearson Education.
4. Fischer, “Crafting a compiler in C”, Pearson Education.

MCA-14-52 ADVANCED WEB TECHNOLOGY

Maximum marks: 100 (External: 80, Internal: 20) Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

UNIT – I

Introduction: DNS caching and prefetching, CSS Expressions and performance, Buffering, Weblog.

Search Engines: Searching techniques used by search engines, keywords, advertisements, Search Engine Optimization (SEO) for individual web pages: header entries, selection of URL, SEO for entire website: Hyperlinks and link structure, page rank of Google, robots,

Pitfalls in Optimization: optimization and testing, keyword density, duplicate contents, broken links, poor readability, navigation styles; tools for optimization: etracking, Google analytics.

UNIT – II

PHP: Introduction, Variables, Data Types, Operators and Expressions, Control Flow; Functions; Code Blocks and Browser Output, Objects, String Manipulation and Regular Expressions, Authentication with PHP, Interaction with File System and Server, Form processing, Session Management, cookies, generating dynamic contents with MySQL.

UNIT – III

Advanced Development: Object oriented JavaScript, callbacks, closures, modules, AJAX, JQuery: Introduction, Traversing and Working with DOM, Listening to DOM events, Styling. Angular.js: Introduction, Directives, Forms, Services, MVC development.

UNIT – IV

Optimization: Optimizing images, Load balancers, Tuning MYSQL, query caching, query execution and optimization, traffic generation.

Security: Introduction, Handling user access and user input, Bypassing client-side controls, Authentication, Session management and Session hijacking, Attacks on data stores: SQL query log, SQL injections; Attacks on Users: XSS attacks; Cross-site Request Forgery (CXRF), Dos and DDos attacks, DNS hijacking.

Reference Books:

1. Peter Smith, “Professional Website performance”, Wiley India Pvt. Ltd.
2. Deitel H.M., Deitel P.J., “Internet & World Wide Web: How to program”, Pearson Education.
3. Kogent Learning, “Web Technologies: HTML, JavaScript, PHP, Java, JSP, XML, AJAX – Black Book”, Wiley India Pvt. Ltd.
4. Boronczyk, Naramore, “Beginning PHP, Apache, MySQL Web Development”, Wiley India Pvt. Ltd.
5. Stuttard D., Pinto M., “The Web Application Hackers Handbook”, Wiley India Pvt. Ltd.

MCA-14-53 LINUX AND SHELL PROGRAMMING

Maximum marks: 100 (External: 80, Internal: 20) Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

UNIT – I

Introduction: Basic features, architecture, distributions, Installation requirements; Kernel, Shell.

File System: boot block, super block, inode table, data blocks, accessing files, storage of files, standard directories, system calls for files, file and disk related commands, hard disk partitions; System startup and shut down processes, init and run levels, rc and init files.

UNIT – II

C language compiler, layout of C program in memory, process environment, kernel support, process images, managing zombie and orphan processes, use of makefiles, dependency calculations, dynamic loader, debugging with gdb.

UNIT – III

User Management: Adding new users and groups, super users, creating and mounting file systems. User management commands.

Security and Connections: viewing and changing the permissions and ownerships of files and directories, creating networks, Signal generation and handling, Environment variables, Commands: man, ping, ifconfig, raise, alarm, pause, abort etc.

UNIT – IV

Shell: meaning, types; connecting processes with pipes, tee, redirect input and output, background processes, managing multiple processes, changing priority, scheduling of processes, at, batch and croncommands, process related commands, filters.

Shell Programming: Introduction, shell programming in various shells, file name substitution, read command, operators, conditional statements, looping and case statements, expr statement, command line arguments, parameter passing and arguments, associative arrays, string and mathematical functions, arrays and functions, libraries, shell variables, shell programs to automate system tasks, interrupt processing, shell scripts for administrators, debugging shell scripts.

Text Books:

1. Matthew Neil, Stones Richjard, “Beginning Linux Programming”, 4th Ed., Wiley India Pvt. Ltd.
2. John Goerzen, “Linux Programming Bible”, IDG Books, New Delhi.

Reference Books:

1. Negus Christopher, “Linux Bible”, 8th Ed., Wiley India Pvt. Ltd.
2. Petersen Richard, “Linux: The Complete Reference”, 6th Ed., Tata Mcgraw Hill.
3. Venkateshmurthy M.G., “Introduction to Unix & Shell Programming”, Pearson Education.

MCA-14-54 MOBILE APPLICATION DEVELOPMENT

Maximum marks: 100 (External: 80, Internal: 20) Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

UNIT – I

Introduction: Mobile Applications, Characteristics and Benefits, Application Model, Infrastructure and Managing Resources, Mobile Software Engineering, Frameworks and Tools, Mobile devices Profiles.

Application Design: Memory Management, Design patterns for limited memory, Work flow for Application Development, Techniques for composing Applications, Dynamic Linking, Plug-ins and rules of thumb for using DLLs, Concurrency and Resource Management.

Development: Intents and Services, Storing and Retrieving data, Communication via the Web, Notification and Alarms, Graphics and Multimedia, Telephony, Location based services, Packaging and Deployment, Security and Hacking

UNIT-II

Google Android: Introduction, JDK & ADK, Android Application Architecture, Traditional Programming Model and Android, Activities, Intents, Tasks, Services; Runtime Environment for Applications, Callbacks and Override in application, Concurrency, Serialization, Application Signing, Publishing your application, API keys for Google Maps.

Android Framework: GUI and MVC Architecture, Fragments and Multi-platform development, Creating Widgets: Layouts, Canvas Drawing, Shadows, Gradients; Applications with multiple screens; Handling database in Android: Android Database class, Using the Database API.

UNIT-III

Android Applications: Working with Eclipse and Android, Various life cycles for applications, Building a User Interface: Blank UI, Folding and Unfolding a scalable UI, Making Activity, Fragment, Multiple layouts; Content Provider, Location and Mapping: location based services, Mapping, Google Maps activity, Working with MapView and MapActivity; Playing and Recording of Audio and Video in application; Sensors and Near Field Communication; Native libraries and headers, Building client server applications.

UNIT-IV

Other Platforms: Apple iPhone Platform, Introduction to iPhone OS and iOS, UI tool kit interfaces, Event handling and Graphics services, Layer Animation.

Cross-platform development: Introduction to QT, Platforms supported by QT, Modules and Tools of QT, Introduction to Unity engine for game development.

Reference Books:

1. ZigurdMednieks, Laird Dornin, G,BlakeMeike and Masumi Nakamura “Programming Android”, O’Reilly Publications.
2. Wei-Meng Lee, “Beginning iPhone SDK Progrmming with Objective-C”, Wiley India Ltd.
3. James C.S. “Android Application development”, CENGAGE Learning.
4. Gargenta M., Nakamura M., “Learning Android”, O’Reilly Publications.

MCA-14-55(I) THEORY OF COMPUTATION

Maximum marks: 100 (External: 80, Internal: 20) Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

Unit – I

Finite State Machines: Finite Automata, Designing of DFA and NDFA, NFA with E-Transitions, Equivalence of DFA and NFA with proof, Regular Expressions and Regular languages, Laws of Regular Expressions, Kleene's Theorem 1 and 2, Properties and Limitations of FSM, FSM with Output: Moore and Mealy Machines, Arden's Theorem with proof, Closure Properties of Regular Sets, Pumping Lemma for Regular Grammers, Myhill-Nerode Theorem, Minimization of FA.

Unit – II

Formal Grammars: Definition, Construction of Context Free Grammar, Derivation, Parse Trees, Ambiguity, Removal of Ambiguity, Simplification of Context Free Grammar, CNF and GNF, Closure properties of CFL, Pumping Lemma for CFL.

Pushdown Automaton: Introduction, Types of PDA, Designing of PDA's, Conversion from PDA to CFG and vice-versa, Applications, Parsing: Early's, Cook-Kasami-Young, Tomito's.

Unit – III

Linear Bounded Automata (LBA), Turing Machines (TM), variants of TM: Multitape, Restricted and Universal TM; TM and Computers. Recursive and recursively-enumerable languages and Properties.

Decidability: Post's correspondence problem, Rice's theorem, Cook's Theorem, decidability of membership, emptiness and equivalence problems of languages.

Unit – IV

Decidable languages and problems, Halting problem of TM, Diagonalization method, Turing machines and other undecidable problems.

Computable Functions: Primitive recursive functions, Recursion theorem. Russels's Paradox, Tractable and Intractable problems, Computability and Non-computability and examples of non-computable problems.

Text Books

1. John C. Martin, "Introduction to languages and the theory of computation", McGraw Hill.
2. Peter Linz, "An introduction to formal language & automata", Jones & Bartlett publications.

Reference Books:

1. Hopcroft,J.E.&Ullman,J.D.,"Formal languages and their relation to Automata", Pearson Education.
2. Lewis, H.R. &Papadimitrious, C.H.,"Elements of the theory of computation". PHI Learning.
3. Michael Sipser, "Introduction to the Theory of Computation", Cengage Learning.

MCA-14-55(II) DIGITAL IMAGE PROCESSING

Maximum marks: 100 (External: 80, Internal: 20) Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

UNIT – I

Digital Image Processing: Introduction, Applications, Steps, Components, Image sampling and Quantization, Relationships between pixels.

Image Enhancement: Intensity transformations and spatial filtering, Point and Mask based techniques, Histogram processing, Fundamentals of spatial filtering, Smoothing and sharpening spatial filters.

UNIT – II

Filtering in frequency domain: Fourier Series and Transform, Discrete Fourier Transform, Frequency Domain Filtering Fundamentals, Homomorphic Filtering.

Color Image Processing**:** Color Fundamentals, Color characteristics, Color models, RGB, CYK, CMYK, HIS, YIQ models, Pseudo color image processing, full color image processing, color transformations, Smoothening and sharpening of images.

UNIT – III

Image Restoration: Model of Image Degradation/Restoration process, Noise models, Linear, Inverse filtering, Mean Square Error Restoration, Least Square Restoration.

Image Compression Fundamentals: Lossless and Lossy Compression, Basic Compression Methods: Huffman Coding, Run-Length Coding, LZW Coding, Arithmetic Coding, Bit-Plane Coding, Predictive Coding, Transform Coding, Wavelet Coding, Compression standards.

UNIT – IV

Image Segmentation: Fundamentals, Point, Line and Edge Detection, Thresholding, Region-Based Segmentation.

Image Representation: Boundary Representation, Chain Codes, Polygonal Approximations, Signatures, Boundary Descriptors, Shape Numbers, Topological Descriptors, Texture, Watermarking, Image blending.

Text Book:

1. Gonzalez R.C., Woods R.E., “Digital Image Processing”, Pearson Education.
2. Jayaraman S., Esakkirajan S., Veerakumar T., “Digital Image Processing”, Tata McGraw Hill.

Reference Books:

1. Ganzalez R.C., “Digital Image Processing with MATLAB”, Tata McGraw Hill.
2. Sonka Milan, “Image Processing Analysis and Machine vision”, Cengage Learning.
3. William K. Pratt, “Digital Image Processing”, Wiley India Pvt. Ltd.
4. Chanda B., Majumder D. Dutta, “Digital Image Processing and Analysis”, PHI Learning.
5. Jain A.K., “Fundamental of Digital Image Processing”, PHI Learning.
6. Vipula Singh, “Digital Image Processing with MATLAB and LABVIEW”, Elsevier India.
7. Annadurai, “Digital Image Processing”, Pearson Education.

MCA-14-55(III) SOFT COMPUTING

Maximum marks: 100 (External: 80, Internal: 20) **Time: 3 hours**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

UNIT – I

Basic concepts of neuro-computing*:* Artificial Neural Network (ANN) and their biological roots and motivations, Mathematical Models of Neurons, ANN architecture, Learning rules, Learning Paradigms-Supervised, Unsupervised and reinforcement Learning, ANN training Algorithms-perceptions, Training rules, Delta, Back Propagation Algorithm, Multilayer Perceptron Model, Applications of Artificial Neural Networks, Competitive learning networks, Kohonenselforganizing networks, Hebbian learning; Hopfield Networks, Associative Memories, The boltzman machine; Applications.

UNIT – II

Introduction to Fuzzy Logic: Classical and Fuzzy Sets: Overview of Classical Sets, Membership Function, Fuzzy rule generation. Operations on Fuzzy Sets: Compliment, Intersections, Unions, Combinations of Operations, Aggregation Operations. Fuzzy Arithmetic: Fuzzy Numbers, Linguistic Variables, Arithmetic Operations on Intervals & Numbers, Lattice of Fuzzy Numbers, Fuzzy Equations. Fuzzy Logic: Classical Logic.

UNIT – III

Genetic Algorithm (GA): Evolutionary computing, conditions for evolution, Simple Genetic Algorithm (SGA), different types of operators: Selection, Crossover, mutation and replacement, optimization problems and traditional optimization methods, differences between GA & traditional methods, Holland's schemata theorem, encoding schemes.

UNIT – IV

Random Optimization, Simulated Annealing, Tabu Search, Ant Colony Optimization, Particle SwarmOptimization, Memetic Algorithms.

Text Books:

1. S. N. Sivanandam& S. N. Deepa, "Principles of Soft Computing", Wiley India Pvt. Ltd.
2. Goldberg D. E., "Genetic Algorithms in Search, Optimization, and Machine Learning", Pearson Education.

Reference Books:

1. Jang, Sun, Mizutani, "Neuro-Fuzzy and Soft computing", Pearson Education.
2. Haykin, "Neural networks: a comprehensive foundation", Pearson Education.
3. Mitchell M., "An Introduction to Genetic Algorithms", Prentice-Hall, 1998.
4**.** Klir G.J. & Yuan B., "Fuzzy Sets & Fuzzy Logic", PHI.

MCA-14-55(IV) SYSTEM SIMULATION

Maximum marks: 100 (External: 80, Internal: 20) **Time: 3 hours**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

UNIT – I

System: Introduction, Characteristics, State, Boundaries and Environment.

Simulation: Nature, Models and simulation, need of models, types of models, discrete event simulation, steps in Simulation study, other types of Simulation, when to use simulation, Pitfalls of simulation.

Simulation Concepts: Concepts of Continuous /Discrete System simulations with the help of examples, Numerical Integration vs. Continuous Simulation, Analog vs. Digital Simulation, and Hybrid Simulation.

UNIT – II

Case Studies: Simulation of Pure Pursuit Problem, Chemical Reactor, Water Reservoir System, Single Server & Two Server queuing systems. Simulation of Inventory System.

Simulation software, Simulation package and programming languages, Classification of Simulation software, Desirable software features, General purpose simulation packages.

UNIT – III

Building valid and detailed simulation models, Verification of simulation computer programs, Techniques for increasing model validity,

Random numbers: Types, testing random number generators, generating random variates, General approaches, Generation of uniformly / non-uniformly distributed pseudo random numbers, generating discrete and continuous random variates, Generating Arrival Processes.

UNIT – IV

R: Introduction, Environment, Basic commands, Variables, working with Matrices, User defined functions, Plotting: 2-D Plots, 3-D Plots, Line, Color, Mark Style, Legends etc. Programming in R, Input/output, Function, Control structures.

Case study of Inventory System and Queuing Server System in R.

Text Books:

1. Averill M. Law. “Simulation Modeling and Analysis”, Tata Mcgraw Hill, 4th Edition, New Delhi.
2. Gardener M., “Beginning R: The Statistical Programming Language”, Wiley India Pvt. Ltd.

Reference Books:

1. GeoffereyGordon,”System Simulation”, 2nd Edition, PHI, New Delhi.
2. Lander J.P. “R for Everyone”, Pearson Education.

MCA-14-55(V) CLOUD COMPUTING

Maximum marks: 100 (External: 80, Internal: 20) **Time: 3 hours**

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

UNIT – I

Cloud Computing: Definition, Roots of Clouds, Characteristics, Cloud Architecture – Public, Private, Hybrid, Community, Advantages & Disadvantages of Cloud Computing.

Virtualization: Benefits & Drawbacks of Virtualization, Virtualization Types – Operating System Virtualization, Platform Virtualization, Storage Virtualization, Network Virtualization, Application Virtualization, Virtualization Technologies.

UNIT – II

Cloud Services & Platforms: Compute services, Storage services Database services, Application Services, Queuing services, E-mail services, Notification services, Media services, Content delivery services, Analytics services, Deployment & management services, Identity & access management services. Case studies of these services.

Federated & Multimedia Cloud Computing: Architecture, Features of Federation Types, Federation Scenarios, Layers Enhancement of Federation; Multimedia Cloud.

UNIT – III

Python: Introduction, Installation, Data types: Numbers, Lists, Tuples, Sets, Dictionaries, Files; Input/Output Statements, Control Flow statements, Functions and Variables, Object-Oriented Programming: State, Class, Object, Relationship.

UNIT – IV

Python in Cloud Computing: Iterators & Generators, Functional programming: Recursion, Higher Order Functions; Python for Google Cloud Platform and Windows Azure Platform; Packages: JSON, SMTPLib, NumPy, PiCloud, Django; Cloud Application Development in Python.

Text Books:

1. ArshdeepBahga, Vijay Madisetti, “Cloud Computing – A Hands-on Approach”, University Press, 2014
2. RajkumarBuyya, James Broberg, Andrzej Goscinski, “Cloud Computing – Principles and Paradigms”, Wiley India Pvt. Ltd.
3. Mark Lutz, “Learning Python”, O’Reilly Publications.

Reference Books:

1. Barrie Sosinsky, “Cloud Computing Bible”, Wiley India Pvt. Ltd.

MCA-14-55(VI) HIGH PERFORMANCE NETWORKS

Maximum marks: 100 (External: 80, Internal: 20) Time: 3 hours

Note: Examiner will be required to set NINE questions in all. Question Number 1 will consist of objective type/short-answer type questions covering the entire syllabus. In addition to question no. 1, the examiner is required to set eight more questions selecting two from each unit. Student will be required to attempt FIVE questions in all. Question Number 1 will be compulsory. In addition to compulsory question, student will have to attempt four more questions selecting one question from each Unit. All questions will carry equal marks.

UNIT – I

Brief Networking History: Growth of Internet; The need for speed and Quality of Service; ISPs and Backbone Networks; Wired networks: Telephone Networks; Cable Networks; Connecting devices and Virtual LANs; High-Speed Networks: Frame Relay Networks; Design goals and architecture of SONET and ATM; TCP/IP protocol architecture;

High Performance Networks: Fast Ethernet and Gigabit EthernetCellular networks; Ad Hoc networks;

UNIT – II

Internet Protocol (IP); IPv4 addresses; fragmentation; Type of Service; Datagram format; Classful and classless addressing; DHCP; NAT; CIDR; IPv6 and its comparison with IPv4; Format and Headers of IPv6; traffic class, flow label, IPv6 addresses; ICMP; Mobile IP; Address mapping: Address Resolution Protocol (ARP), Reverse Address Resolution Protocol (RARP);

TCP/IP applications; Client/Server paradigm; Peer-to-Peer Paradigm; Transport layer services; Port numbers; Transport layer protocols; TCP connection; TCP flow and congestion control; UDP services and applications; SCTP

UNIT – III

Standard Client-Server protocols: WWW and HTTP; FTP; E-Mail architecture; TELNET; Secure Internet Routing: Interior and Exterior routing protocols; Autonomous Systems; RIP; OSPF; BGP; Multicasting: IGMP; Group management; format and operation of IGMP; IGMP messages; Client-server programming: Introduction to Sockets; Socket Descriptors; Ports and Connection

UNIT – IV

Network Security: Security services; Attacks; Message confidentiality with symmetric and asymmetric-key cryptography; Message Integrity: fingerprint, message digest, hash algorithms; Authentication; Digital Signature; Key management; Network-layer security: IPSec; Virtual Private Networks;

Transport-layer security: SSL/TLS; Application-layer security: E-mail security; PGP; Firewalls; Quality of Service in IP Networks: Data flow characteristics; Integrated and DifferentiatedServices; Multiprotocol Label Switching; Real-Time Transport Protocol;

Text Books:

1. William Stallings, “High-Speed Networks and Internets, Performance and Quality of Service”.
2. Behrouz A. Forouzan, “Data Communications and Networking”, Fourth Edition, McGraw Hill.
3. B Muthukumaran, “Introduction to High Performance Networks”, Mcgraw-Hill

Reference Books:

1. Douglas E. Comer, “Internetworking with TCP/IP Volume – I, Principles, Protocols, and Architectures”, Fourth Edition, Pearson Education.
2. Mahbub Hassan, Raj Jain, “High Performance TCP/IP Networking, Concepts, Issues, and Solutions”, Pearson Education.
3. James F. Kurose, Keith W. Ross, “Computer Networking, A Top-Down Approach Featuring the Internet”, Pearson Education.
4. Andrew S. Tanenbaum, “Computer Networks”, 4th Edition, PHI.