S.No	Program	Semester	Subject Name and Code	Subject Code	Course Coordinator(s)	Syllabus for MSE-I
1	B.Tech.	4th	Discrete Mathematics	PCCS-103	Dr. Manpreet Kaur Mand Pf. Shailja Sharma Dr. Amit Jain Dr. Preetkamal Singh	Fundamentals of Sets, Relations and Functions: Sets – Operations on sets, Subsets, Types of sets, Ordered pairs, Proofs of general identities of sets, Classes of sets and partitions, Countable and uncountable sets. Relations –Representations of relations, Types of relations, Composition of relations, Closure properties of relations, Equivalence relations, Compatibility relations, Partial order relations. Functions – Introduction and types of functions, Sum and product of functions, Hashing functions, Recursively defined functions. Prepositional and Predicate Logic: Prepositions and compound prepositions, Logical connectives, Truth tables, Logical implication and logical equivalence, Normal forms– Conjunctive and Disjunctive, Validity of well-formed formula, Propositional inference rules–Modus ponens and modus tollens. Predicate logic, Universal and existential quantification, Limitations of propositional and predicate logic. Combinatorial Mathematics: Basic counting principles, Permutations and combinations, Pigeonhole principle, Inclusion and exclusion principle, Recurrence relations – Solving homogeneous and non- homogeneous recurrence relations, Sequences, Generating function.
2	B.Tech.	4th	Computer Architecture & Microprocessor	PCCS-104	Dr. Preetkamal Singh Pf. Khushi Pf. Lakhvir Kaur Pf. Paramveer Kaur	Part-A (Unit - 1 -5) Data Representation: Data types, Complements, Fixed point representation, Floating point representation, Error detection and correction. Register Transfer and Micro-operations: Addition, Subtraction, Multiplication and division algorithms and hardware, Register transfer language and operations, Arithmetic micro-operations, Logic micro-operations, Shift micro-operations, Arithmetic logic shift unit. Computer Organization and Design: Instruction codes, Computer registers, Computer instructions, Timing and control, Instruction cycle, Memory reference instructions, Input/ Output and interrupts, Design and working of a complete basic computer, Control functions, Design of accumulator logic. Central Processing Unit and Input-Output Organization: General register organization, Stack organization, Addressing modes, RISC and CISC architecture, I/O interface, Asynchronous data transfer, Modes of transfer, Priority interrupt, DMA, I/O processor. Memory Organization: Memory hierarchy, Main memory, Auxiliary memory, Associative memory, Cache memory, Virtual memory, Memory management hardware.
3	B.Tech.	4th	Operating System	PCCS-105	Pf. Amanpreet Singh Brar Dr. Daljit Singh Pf. Harkomalpreet Kaur Pf. Kamaljeet Kaur	Introduction: Concept of Operating Systems, Generations of Operating systems, Types of Operating Systems, OS Services, System Calls, Structure of an OS-Layered, Monolithic, Microkernel Operating Systems, Case study on UNIX and WINDOWS Operating System Process management: Concept of processes and threads, Definition, Process and Program, Different states of a Process, Process State transitions, Process Control Block (PCB), Context switching Thread: Definition, Various states, Benefits of threads. Process Scheduling: Foundation and Scheduling objectives, Types of Schedulers, Scheduling criteria: CPU utilization, Throughput, Turnaround Time, Waiting Time, Response Time; Scheduling algorithms: Pre-emptive and Non pre-emptive, FCFS, SJF, RR; Multiprocessor scheduling: Real Time scheduling.
4	B.Tech.	4th	Data Structure	PCCS-106	Pf. Shailja Pf. Meetali Pf. Palak Sood Pf. Kuljit Kaur Pf. Harshim	Basic concepts: Concept of data type, Linear and non-linear data structures, Data structures versus data types, Operations on data structures, Algorithm complexity and Asymptotic notations. Arrays: Linear and multi-dimensional arrays and their representation, Operations on arrays, Sparse matrices and their storage. Stacks: Sequential representation of stacks, Operations on stacks, Application of stacks – parenthesis checker, Evaluation of postfix expressions, Conversion from infix to postfix, Conversion from infix to prefix representation, Tower of Hanoi problem, implementing recursive functions. Queues: Sequential representation of queue, Types of queue- Linear Queue, Circular Queue, Deque,Priority Queue,Operations on each types of Queues and their algorithms, Applications of Queues.

5	B.Tech.	4th	Software Engineering	PCCS-107	Pf. Jasdeep Kaur Dr. Kiran Jyoti Pf. Manjot Kaur Gill Dr. Inderjeet Singh Dr. Hardeep Singh Kang	Part-A Introduction: Evolution and impact of software engineering, Software myths, Software application domains, Software crisis – Problem and causes. Software Process Models: Software process, Software process models – Waterfall model, Prototype model, Spiral model, Evolutionary model, RAD model, V-model and Component based model. Requirements Engineering: Feasibility study, Problem analysis, Requirement elicitation and specification, Functional and non-functional requirements, Software requirements specification document, Requirement validation and management. Project Management and Risk Analysis: Project planning, Cost estimation techniques– Size metrics, Empirical estimation, Heuristic estimation and analytical estimation, Project monitoring and control– Work breakdown structure, Activity chart, Gantt charts, PERT charts, Critical path method, Manpower management, Risk management-Identification, Analysis, Planning and Monitoring .
6	B.Tech.	4th	Environmental Sciences	MCCS-101	Pf. Jasleen Kaur (IT) Pf. Palwinder Kaur (IT) Pf. Manjot Singh Bedi (ME) Pf. Bhupinder Singh Dhillon (ME) Pf. Prem Singh (ME)	Natural resources: Renewable and non-renewable resources, Natural resources and associated problems, Forest resources- Use and over-exploitation, deforestation, case studies, Timber extraction, mining, dams and their effects on forests and tribal people. Water resources: Use and over-utilization of surface and ground water, floods, drought, conflicts over water, dam's benefits and problems, Food resources- World food problems, changes caused by agriculture and over gazing, effects of modern agriculture, Fertilizers- pesticides problems, water logging, sanity, case studies, Energy Resources- Growing energy needs, renewable and non-renewable energy sources, use of alternate energy sources, case studies, Land Resources- Land as a resource, land degradation, man induced and slides, soil erosion and desertification.
7	B.Tech.	6th	Compiler Design	PCCS-112	Dr. Diana Nagpal Pf. Kuljit Kaur	Part-A Introduction to Compiler: Language Processors, The Structure of a Compiler, The Grouping of Phases into Passes, Applications of Compiler Technology, Programming Language Basics. Lexical Analysis: Role of lexical analyzer, Tokens, Patterns, and Lexemes, Attributes for Tokens, Lexical Errors, Input Buffering, Sentinels, Specification of Tokens, Recognition of Tokens, The Lexical-Analyzer Generator Lex, Finite Automata. Syntax Analysis: Introduction, Role of the parser, Context-Free Grammars (CFG), Writing a Grammar, Writing a Grammar, Top down parsing –Backtracking, LL(1), Recursive descent parsing, Non-recursive Predictive Parsing. Bottom-up parsing – Shift reduce parsing, LR parsers, SLR parser. Canonical LR parser, LALR parser, Introduction to The Parser Generator Yacc. Syntax-Directed Translation: Syntax-Directed Definitions,
8	B.Tech.	6th	Computer Graphics	PCCS-113	Dr. Parminder Singh Pf. Maninder Kaur	PART A: Introduction: Overview of computer graphics, Computer graphics applications, Different I/O devices with specialized graphics features, Elements of graphics. Graphic systems – Video display devices, Raster scan systems, Random scan systems. Video basics – Video controller, Raster-scan display processor. 2D Primitives: Scan conversion basics, Algorithm for scan converting a point, Scan converting a line – Digital differential analyser algorithm, Bresenham's line algorithm. Scan converting circle – Bresenham's circle drawing algorithm, Midpoint circle drawing algorithm. Scan converting ellipse– Midpoint ellipse algorithm. Filling Techniques – Scan line polygon fill algorithm, Boundary-fill, Flood-fill. Anti-aliasing. 2-D Transformations: Geometric and coordinate transformations. Geometric transformations – Scaling, Rotation, Translation, Reflection, Shear. Matrix representations, Homogeneous coordinates, Composite transformations.

9	B.Tech.	6th	Machine Learning	PCCS-114	Dr. Priyanka Arora Dr. Kamaldeep Kaur	Part A: Unit 1 to 4 Introduction: Well defined learning problems, defining a learning system, perspectives and issues in machine learning, the concept learning task, concept learning as search, Find-S: finding a maximally specific hypothesis, version spaces and the candidate elimination algorithm, Inductive bias, probability theory. Supervised Learning: Basic methods: Distance based methods, Nearest- Neighbors, Decision Trees, Naive Bayes, and Linear models: Linear regression, Logistic Regression, Generalized Linear Models, Support Vector Machines, Nonlinearity and kernel Methods. Unsupervised Learning: Clustering: k-means/ kernel k-means, Dimensionality Reduction: PCA and kernel PCA, Matrix Factorization and Matrix Completion, Generative models (mixture models and latent factor models). Decision Tree Learning: Introduction, decision tree representation, appropriate problems for decision tree learning, the basic decision tree learning algorithm, hypothesis space search in decision tree learning, Inductive bias in decision tree learning, Ensemble methods- Bagging, Gradient Boosting, Random Forest.
10	B.Tech.	6th	Cloud Computing-I	OECS-113	Pf. Harkomalpreet Kaur	Introduction to Amazon Web Services (AWS) Cloud: Global infrastructure of AWS cloud, Cloud Services: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS), Cloud storage. Structure of Cloud: Availability Zone, Edge Location, Origin, Latency, Region. Introduction to AWS Console. Virtual Servers, Content Delivery and Virtual Storage: Virtual Servers: Amazon Elastic Compute Cloud (Amazon EC2), Domain Name, Domain Name System (DNS), Amazon S imple Storage Service (S3) bucket, Amazon Route 53, Javascript Object Notation (JSON), Dynamic website, Static website. Content Delivery: Amazon CloudFront, AWS Direct Connect, Caching, Content Delivery Network (CDN), Distribution. Virtual Storage: Amazon Simple Storage Service (Amazon S3), Amazon Elastic Block Store (Amazon EBS), Hard Disk Drive (HDD), Solid State Drive (SDD), Input / Output Operations Per second (IOPS) Cloud Security and Monitoring the Cloud: Cloud Security: AWS Identity and Access Management (IAM), Role, User, Security group, Policy, Amazon Inspector, Root User, Credential, Multi-Factor Authentication (MFA), AWS shield, AWS Web Application Firewall (WAF), Distributed Denial of Service (DDoS), AWS Artifact. Monitoring the Cloud: Amazon CloudWatch, AWS CloudTrail, AWS Config, Amazon Simple Notification Service (Amazon SNS)
11	B.Tech.	6th	Software Testing & Quality Assurance	PECS-102	Dr. Daljit Singh	Introduction: Overview of Software Engineering, Software Process, Process Models, Overview of Project Management Process and its Phases. Testing principles and basic concepts: Testing Concepts: Purpose of Software Testing, Testing Principles, Goals of Testing, Testing aspects: Requirements, Test Scenarios, Test cases, Test scripts/procedures, Strategies for Software Testing, Testing Activities, Mistakes, Faults & Failures, Planning for Verification and Validation, Software Inspections, Automated Static Analysis, Verification and Formal Methods, Levels of Testing White-Box Testing: Test Adequacy Criteria, Static Testing, Structural Testing, Code Complexity Testing, Mutation Testing, Data Flow Testing Black-Box Testing: Test Case Design Criteria, Requirement Based Testing, Positive and Negative Testing, Boundary Value Analysis, Equivalence Partitioning State Based Testing, Domain Testing.Test planning and Execution: Test Plan, Test Management, Test Execution and Reporting, Test Specialist Skills, Tester's Workbench and Tool Categories, Test Maturity Model and Test Process Assessment, Debugging & Root Cause Analysis, Software Items, Component & Units, Test Bed, Traceability and Testability, Attributes of Testable Requirements, Test Matrix, Types of Testing Documentation, Verification Testing, Validation Testing, Integration Testing, System and Acceptance Testing, GUI Testing, Regression Testing, Selection, Minimization and Prioritization of Test Cases for Regression Testing, Creating Test Cases from Requirements and Use cases, Software Defects: Origins of Defects, Defect Classes, Defect Repository / Test Design, Defect Repository

12	B.Tech.	6th	Network Security & Cryptography	PECS-108	Pf. Satinderpal Singh	Part-A Introduction to Security: Essentials of network security, Architecture, Security goals, cryptographic attacks: cryptanalytic, non-cryptanalytic attacks, active attack and passive attack, security Services and security mechanism, Fundamental Security design principles, Network security model, standards. Number Theory: Integer Arithmetic, Euclidean Algorithm, Extended Euclidean Algorithm, Modular Arithmetic, Matrices, Linear Congruence, Prime numbers, Fermat's and Eular's Theorem, Factorization, Chinese Remainder Theorem. Classical Encryption Techniques: Encryption, Decryption, Plaintext, Cipher text, Key range and Size, Symmetric cipher model, Substitution techniques: Mono-alphabetic ciphers (additive, Caesar, Multiplicative, affine), polyalphabetic cipher (autokey, playfair, Hill Cipher) Transposition techniques (keyless, keyed, combined approaches)
13	B.Tech.	6th	Advanced Database Management System	PECS-114	Pf. Jasdeep Kaur	Part - A Introduction to SQL Programming Techniques: Database Programming: Issues and Techniques, Embedded SQL, Dynamic SQL, Database Programming: Data Types, Variables, Constraints, Operators, Conditions, Loops, Strings, Arrays, Procedures, Functions, Cursors, Records, Exceptions, Triggers, Packages, Database Stored Procedures. Transaction Processing and Optimization: Transaction Processing Concepts, Concurrency Control Techniques, Timestamp ordering, Multiversion Concurrency Control Techniques, Validation (Optimistic) Concurrency Control Techniques, Granularity of Data Items and Multiple Granularity Locking. Query Processing and Optimization: Query Processing, Syntax Analyzer, Query decomposition, Query Optimization, Heuristic Query Optimization, Algorithms for SELECT and JOIN Operations, Algorithms for PROJECT and Set Operations, Implementing Aggregate Operations and OUTER JOINS. Using Selectivity and Cost Estimation in Query Optimization. Semantic Query Optimization.
14	B.Tech.	6th	Natural Language Processing	PECS-120	Pf. Goldendeep Kaur	Introduction: Introduction to natural language and speech processing, Steps for processing natural languages, Issues and challenges for processing of natural languages, Elements of information theory, Brief history of natural language processing. Morphological Analysis: Inflectional and Derivational morphology, Morphological parsing, Lexicon and Morphotactics, Finite state transducers, N-gram language models, N-gram smoothing, Entropy. Part-of-Speech Tagging: Word classes, Part-of-speech tagging, Tagsets, POS tagging Techniques – Rule- based, Stochastic, Transformation-based. Applications: Different application areas of natural language processing – Machine translation, Machine learning, Text categorisation and summarisation, Speech synthesis, Speech recognition, Optical character recognition, Database access, etc.
15	B.Tech.	6th	Java Programming	PECS-126	Dr. Inderjit Singh	Introduction: History of Java, Importance of Java to the internet, Java's Magic – The Byte code features of Java, Overview of Java. Java Basics: Data-types, Variables, Arrays, Operators, Expressions, Control statements, Type conversion, Concepts of classes and objects, Constructors, Methods, Access control, this keyword, Garbage collection, Overloading methods and constructors, Parameter passing, Recursion, Understanding static, Introducing nested and inner classes, Using command line arguments, Introduction to string handling.Inheritance: Basics of inheritance, Types of inheritance, Member access rules, Using super, Using final with inheritance, Method overriding, Dynamic method dispatch, Using abstract classes. Packages and Interfaces: Defining a package, Accessing a package, Understanding CLASSPATH, Importing packages, Differences between classes and interfaces, defining an interface, implementing interface, Variables in interface, Extending interfaces.
16	B.Tech.	6th	Cyber Security	PCCS-115	Dr. Vivek Thapar Dr. Amandeep Kaur Sohal Dr. Kapil Sharma	Introduction to Cyber Space: History of cyber space, Cyber Crime, Information Security, Computer Ethics and Security for users, Familiarization with secure web browser and guidelines to choose, Role of Antivirus, Guidelines for Secure password, Two-steps authentication, Introduction to Password Manager, Wi-Fi Security. Secure Social Media usage and security: Best practices for safer Social Networking, Basic Security for Windows, User Account Password Smartphone Security, Android Security, IOS Security. E-commerce Security: Familiarization: Online Banking Security, Mobile Banking Security, Security of Debit and Credit Card, UPI Security.

17	B.Tech.	8th	Software Metrics	PECS-105	Dr. Kiran Jyoti	Software Metrics: Measurement in software engineering, software metrics, Metrics data collection and analysis. Complexity Metrics and Models: Lines of Code, Halstead's Software Science, Cyclomatic Complexity Syntactic Metrics, and An Example of Module Design Metrics in Practice. Object Oriented Projects: Object Oriented Concepts and Constructs, Productivity Metrics, Quality Management Metrics. Estimate internal product attributes: Aspects of software size, length, functionality, and complexity, measuring structure, types of structural measures, control-flow structure, and modularity and information flow attributes, data structures. Estimate external product attributes: Modeling software quality, software reliability, software reliability problem, parametric reliability growth models
18	B.Tech.	8th	Block Chain Technology	PECS-113	Pf. Jagdeep Kaur	UNIT -1 Introduction to Cryptography: Need of Cryptography, Traditional and Modern techniques, Hash function, Distributed Hash Table, Digital Signatures, Symmetric and Asymmetric Key Cryptography, Zero Knowledge Proof, Double Spending problem. UNIT -2 Introduction to Blockchain: Distributed Database, shortcomings of current transaction systems, distributed network, difference between blockchain and traditional database, evolution of blockchain. Bitcoin's Architecture, Blockchain Architecture: merkle root tree, gas limit, transactions and fee, nonce value, anonymity, reward, chain policy, miners, validators, types (private and public blockchains), Challenges to Blockchain Implementation, Features of Blockchain Network, Soft & Hard Fork. Unit- 3 Distributed Consensus I: The mining mechanism, Two Generals Problem, Byzantine General problem and Fault Tolerance, Nakamoto consensus, Evaluation aspects Blockchain consensus protocols: Scalability, Throughput (TPS), Latency, Security, Fault Tolerance Rate, Energy Consumption.
19	B.Tech.	8th	Parallel and Distributed Algorithms	PECS-129	Pf. Harshim	Introduction: The Idea of Parallelism, Parallel Computing, Models of computation, Parallel Algorithms analysis, Parallel Algorithms models, Design Techniques, Matrix Multiplication, Sorting, Parallel Search Algorithm, Graph Algorithms. PRAM Algorithms: PRAM Model of Parallel Computation, Parallel Reduction, Prefix Sums, List Ranking, Preorder Tree Traversal, Merging Two Sorted Lists, Graph Coloring, Reducing the Number of Processors and Brent's Theorem, Dichotomoy of Parallel Computing Platforms, Cost of Communication. Pipeline Processing: Introduction, Pipeline Performance, Arithmetic Pipelines, Pipelined Instruction Processing, Pipeline Stage Design, Hazards,
20	B.Tech.	8th	Big Data	PECS-118	Pf. Himani Sharma (IT)	Part-A Introduction to Big Data: Big data overview, V's of big data, Data structures, State of the practice in analytics, Current analytical architecture, Drivers of big data, Big data ecosystem and a New Approach to Analytics, Key roles for the new big data ecosystem, Data at rest v/s data at motion, Examples of big data analytics tools. Apache Hadoop: Understanding distributed system and Hadoop, Comparing SQL databases and Hadoop, MapReduce building blocks of Hadoop –Name node, Data node, Secondary name node, JobTracker, Task-Tracker, Introducing and configuring Hadoop cluster – Local, Pseudo distributed mode, Fully distributed mode, Handling web-based Cluster, and Configuring XML files. Working with Hadoop: Interacting with HDFS, Steps to read and write into HDFS. Anatomy of MapReduce Program – Hadoop data type, Mapper and Reducer, Partitioner, Combiner, Reading and writing format, Word count with predefined Mapper and reducer. Introduction to with Hive and Spark.

21	B.Tech.	8th	Applied Cloud Computing	PECS-135	Dr. Vivek Thapar	Introduction to Amazon Web Services (AWS) Cloud: AWS Cloud global infrastructure, Cloud Service Models: Infrastructure as a Service (IaaS), Platform as a Service (PaaS), and Software as a Service (SaaS), Cloud storage. Structure of Cloud: Availability Zone, Edge Location, Origin, Latency, Region. Introduction to AWS Console. Content Delivery: Amazon CloudFront, AWS Direct Connect, Caching, Content Delivery Network (CDN), Distribution. Cloud Security and Cloud Monitoring: Cloud Security: AWS Identity and Access Management (IAM), Role, User, Security group, Policy, Amazon Inspector, Root User, Credential, Multi-Factor Authentication (MFA), AWS shield, AWS Web Application Firewall (WAF), Distributed Denial of Service (DDoS), AWS Artifact. Cloud Monitoring: Amazon CloudWatch, AWS CloudTrail, AWS Config, Amazon Simple Notification Service (Amazon SNS)
22	B.Tech.	8th	Internet of Things	PECS-112	Dr. Amandeep Kaur Sohal	Introduction to Internet of Things (IoT): IoT Definition, IoT Vision, Smart and Hyper-connected Devices, Conceptual Framework, Architectural View, Technology behind IoT, Major Components of IoT System, Sources of IoT, Examples of IoT. IoT & M2M: Difference between IoT and Machine to Machine, M2M Architecture, SNMP protocol, IoT reference model, Lightweight M2M Communication Protocol, Domain model - information model, functional model, communication model. Design Principles for Web Connectivity: Constrained Application Protocol, JSON (Java Script Object Notation) Format, Tag Length Value Format, MIME (Multipurpose Internet Mail Extension) Type, Message Communication Protocols for Connected Devices, Web Connectivity for Connected Devices Network.
23	M.Tech.	2nd	Advance Algorithms	MCS-103	Pf. Manjot Kaur Gill	Introduction to analysis of algorithms: Review of various sorting algorithms, Asymptotic Notation, Performance analysis, space and time complexity. Fundamental Techniques: Divide and Conquer, Greedy Method, Dynamic Programming. Graphs: Definitions and Elementary Algorithms- Shortest path by Breadth First Search, Depth First Search and computation of strongly connected components, shortest path in edge weighted case (Dijkstra's Algorithm), correctness proof of Dijkstra's algorithm, Directed Acyclic Graphs -Topological sorting. Dynamic Programming: Elements of dynamic programming, Applications of dynamic programming – Rod cutting problem, Bellman-Ford algorithm and Floyd-Warshall algorithm for shortest path in graphs. Greedy Algorithms: Introduction to greedy algorithms, Elements of greedy strategy, Prim's and Kruskal's algorithm for minimum spanning tree, Introduction to Matroids.
24	M.Tech.	2nd	Soft Computing	MCS-104	Dr. Priyanka Arora	UNIT-I Introduction: Introduction to Soft Computing, Historical Development, Definitions, advantages and disadvantages, Hard computing vs soft computing, Applications of soft computing. UNIT-II Neural Networks: Model of an artificial neuron, Comparison of artificial neural network and biological neural network, Neural network architectures, Learning methods, Activation functions, Perceptron, Hopfield network, Back-propagation network, Radial basis function network, Competitive Neural Nets- Kohonen self-organizing feature maps, Learning Vector Quantization (LVQ), Adaptive Resonance Theory (ART). UNIT-III Fuzzy Logic: Concept of fuzziness, Fuzzy vs crisp, Crisp sets, Operations on crisp sets, Properties of crisp sets, Fuzzy sets, Features of fuzzy sets, Basic fuzzy set operations.
25	M.Tech.	2nd	Network Security	MCS-133	Dr. Amit Jain	Overview of Network Security: Basic concepts: confidentiality, integrity, availability, security policies, security mechanisms, assurance, Review of Cryptography: Secret key Cryptography, Public Key Cryptography,Encrypting large messages (ECB, CBC, OFB,CFB, CTR), Examples DES, RSA. Message Digests: Applications, Strong and weak collision resistance, The Birthday Paradox, MD5, SHA-1, Authentication: Security Handshake pitfalls, Online vs. offline password guessing, Reflection attacks, Per-session keys and authentication tickets, Key distribution centers and certificate authorities

| 26 | M.Tech. | 2nd | Information Storage and Management | MCS-144 | Pf. Jaswant Singh Taur | Introduction to Storage Technology: Creation of data and value of data for business, Information Lifecycle, Challenges in storage and managing the data, Solutions for data storage, Core elements of a Data Center infrastructure, role of each element in supporting business activities, Storage Systems Architecture: Hardware and software components of the host environment, Key protocols and concepts used by each component, Physical and logical components of a connectivity environment. Concept of RAID and its components, Different RAID levels.Working of an intelligent storage system Introduction to Networked Storage: Evolution of networked storage, Architecture, components, and topologies of FC-SAN, NAS, and IP-SAN, Benefits of the different networked storage options, Understand the need for long-term archiving solutions. Understand the appropriateness of the different networked storage options for different application environments |