CSE/ Library

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BT-4/M-24 44151

DISCRETE MATHEMATICS
PC-CS-202A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Prove that $[p \Rightarrow (q \Rightarrow r)] \Rightarrow [(p \Rightarrow q) \Rightarrow (p \Rightarrow r)]$ is a tautology. 5

   (b) Prove that : 5

   $$(A \cup B) \cap C = (A \cap C) \cup (B \cap C)$$

   (c) Prove the following proposition by PMI : 5

   $$1 + 2 + 3 + 4 \ldots\ldots\ldots\ldots + n = (n(n + 1))/2$$

2. Explain Principle of Inclusion and exlusion.A survey on a sample of 25 new cars was conducted to see which of three popular options, Air conditioning(A), radio(R), Power windows(P) were installed.The survey found that 15 had air conditioning, 4 had radio and power windows, 12 had radio, 3 had all three options, 5 had air conditioning and power windows, 2 had no options and 9 had air conditioning and radio. 15

Draw venn diagram and find the number of cars that had

(i) Only power windows

(ii) Only one of the options

(iii) Air conditioning and radio but not power windows.

(iv) Only radio.

Unit II

3. (a) Let A = {4, 6, 8, 10} and R = {(4, 4), (4, 10), (6, 6), (6, 8), (8, 10)}. Find the transitive closure using warshall's Algorithm and also write steps of the warshall's algorithm. **8**

(b) Define Relations. Let X = {1, 2, 3, 4, 5, 6} and R be a relation defined as $(x, y) \in R$, if and only if $x-y$ is divisible by 3. List the elements of Relation R. **7**

4. (a) Consider a set D45 = {1, 3, 5, 9, 15, 45}and let the relation $\leq$ be the relation (divides) be a partial ordering on D45 : **10**

(i) Determine GLB and LUB of B, B is subset of D45, where B = {9, 15, 45}

(ii) Determine GLB, LUB of B, B is subset of D45, where B = {1, 3, 5}

(iii) Draw Hasse diagram for D45.

(b) Differentiate between Symmetric, Antisymmetric and Asymmetric relations with suitable examples. 5

Unit III

5. (a) Solve the recurrence relation $a_{r+2} - 5a_{r+1} + 6a_r = 2$ by using method of generating functions satisfying the initial conditions $a_0 = 1$ and $a_1 = 2$. 10

(b) How many people at least in a group of 85 people have same initials ? 5

6. (a) Describe types of functions with suitable examples. 10

(b) From a committee consisting of 6 men and 7 women, in how many ways can a committee be constructed, if committee consists of (i) 3 men and 4 women (ii) 4 members, which has at least one woman. 5

Unit IV

7. (a) Define the following terms with suitable examples : 10

(i) Monoid

(ii) Abelian Group

(iii) Ring Homomorphism

(iv) Group.

(b) Let G = {–1, 0, 1}, verify whether G forms a group under usual addition. 5

8. (a) Consider an Algebraic system (Q, *), Q is a set of rational nos. and * is defined as $a*b = a + b - ab$ $\forall\ a, b \in Q$. Determine whether (Q, +) is a group. 10

(b) Define a Semigroup. Write properties for a Semigroup. Explain with a suitable example. 5

Roll No. ..... Total Pages : 00

BT-4/M-24 44152

INTERNET TECHNOLOGY AND MANAGEMENT

PC-CS-204A

: Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (a) Explain the concepts of Internet, Intranet, and Extranet, highlighting their differences and commonalities. 7

   (b) Elaborate the impact of the Internet on business culture and collaborative computing. How has the Internet transformed traditional business practices and facilitated global collaboration ? 8

2. (a) Describe the role of modems, communication software, and Internet tools in enabling access and interaction on the Internet. 7

(b) With the advent of IPv6, what are the key advantages and challenges compared to its predecessor, IPv4 ? How does IPv6 address the growing demands of an increasingly interconnected world ? 8

Unit II

3. (a) Explore the workings of search engines. How do search engines retrieve and present information from the vast expanse of the internet ? 8

(b) Differentiate between directories, search engines, and meta-search engines in terms of their functionality and scope. How do these tools aid users in locating information on the World Wide Web ? 7

4. Elaborated the protocols Telnet, FTP, HTTP, and Gopher, highlighting their respective functionalities and applications in internet communication. How do these protocols facilitate data transfer and resource access across networks ? 15

Unit III

5. (a) Discuss the role of MIME types in email communication and how they enable the transmission of various types of content, such as text, images, audio, and video. 7

(b) Explain the concept of email management and the tools available for organizing, prioritizing, and archiving email messages. 8

6. (a) How can JavaScript be used to manipulate the Document Object Model (DOM) and respond to user interactions such as clicks and keyboard input ? Provide examples of how event handling and DOM manipulation are implemented in JavaScript code. 8

(b) What are scripting languages, and how do they differ from markup languages like HTML ? 7

Unit IV

7. Compare and contrast popular web server software such as PWS, IIS, and Apache, highlighting their features, advantages, and typical use cases. How do these servers differ in terms of performance, scalability, and compatibility with different operating systems ? 15

8. (a) Explain the concept of encryption schemes and their role in ensuring the confidentiality and integrity of web communication. What are the common encryption protocols used to secure web documents and transactions, and how do they function ? 8

(b) Describe the components and functionalities of firewalls and intrusion detection systems (IDS) in safeguarding web servers from unauthorized access and malicious activities. 7

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BT-4/M-24 44153

OPERATING SYSTEMS

PC-CS-206-A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. (i) Write a short note on various types of operating systems and also give one example of each type : 10

   (a) Multiprogramming OS

   (b) Multitasking OS

   (c) Real Time OS.

   (ii) Define Operating System. List different services provided by Operating System. 5

2. (i) Explain various protections in operating system. 7.5

(ii) Explain simple and layered structure of operating system in detail. 7.5

Unit II

3. What do you mean by CPU scheduling ? Differentiate preemptive and non–preemptive scheduling with suitable examples. 15

4. (i) Define a process. Explain various states of a process with suitable diagram. 10

(ii) What is critical section problem ? 5

Unit III

5. Define Deadlock. Explain algorithm for deadlock avoidance. Consider a computer has six tape drives, with n processes competing for them. Each process may need two drives. What is the maximum value of n for the system to be deadlock free. Also list the conditions that lead to deadlock. 15

6. Define Paging. Explain FIFO page replacement policy. Consider page reference string 1,3,0,3,5,6,3 with 3 page frames. Find the number of page faults. 15

Unit IV

7. Define Disk Scheduling. Explain C-SCAN algorithm for disk scheduling with suitable example. 15

8. Explain the following terms in detail : 15

   (i) Polling

   (ii) DMA

   (iii) Interrupts.

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BT-4/M-24 44154

DESIGN AND ANALYSIS OF ALGORITHMS

Paper : PC-CS-208A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit.

Unit I

1. (a) What are Asymptotic Notations ? Also explain its types. 10

   (b) Explain the term Time and Space Complexity. 5

2. What do you mean by Analyzing Algorithms ? Analyze any sorting algorithm and find its complexity. 15

Unit II

3. Write Algorithm for Longest Common Subsequence and explain it with the help of example. 15

4. What are Splay tress and Red-Black trees ? Write algorithms for insertion and deletion in Red-Black trees. 15

Unit III

5. (a) Explain Topological Sort with the help of example. 7.5

   (b) Write Algorithm for Breadth First Search and explain it. 7.5

6. (a) What are NP-hard and NP-complete classes ? Explain. 5

   (b) Explain the concept of Relaxation and write Dijkstra's algorithm. 10

Unit IV

7. Write Ford Fulkerson algorithm and explain it with the help of example. 15

8. Explain the following terms : 15

   (i) Maximum Bipartite Matching

   (ii) Merging Network

   (iii) Bitonic Sorting Network.

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BT-4/M-24 44215

UNIVERSAL HUMAN VALUES II : UNDERSTANDING HARMONY HTM-901A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *Five* questions in all, selecting at least *one* question from each Unit. All questions carry equal marks.

Unit I

1. "The value of an entity is its participation in the larger order of which is it a part ?" Elaborate this statement and also explain the term Value Education and its guidelines. 15

2. (a) Self Exploration– A dialogue between "What I am" and "What is naturally acceptable to me". Explain. 7.5

   (b) "There is an essential complementarity between Values and Skills. The priority is values then skills." Elaborate the statement. 7.5

Unit II

3. Explain the concept of Self-regulation and how will it be related to the Self and Body ? Describe the programme for Self-regulation and Health. **15**

4. "A gross misunderstanding is to assume the Self and the Body to be the same and this leads to the feeling of deprivation and exploitation." Elaborate the statement. **15**

Unit III

5. (a) There is harmony in the family, mutual happiness in the family, when we understand the feelings and ensure in our family. Describe these Feelings (values) in detail. **7.5**

   (b) Respect is Right Evaluation. Elaborate it. **7.5**

6. How is 'Trust' the foundational value in relationship ? Also describe the role of Justice in relationship. **15**

Unit IV

7. Describe the dimensions of Human Order. Also explain the Program of Action which is required to understand harmony and live in the harmony at all levels. **15**

8. (a) Describe the goals of human being living in a society. Also explain the three kinds of obsessions. 7.5

(b) What do you understand by Education-Sanskar and its role ? Explain the natural process of a child in an environment of relationship and in an environment of domination. 7.5

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46165

BT-6/M-24

COMPILER DESIGN

Paper–PC-CS-302A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *five* questions in all, selecting *one* question from each unit.

UNIT–I

1. What are different phases of Compiler and also write the role of these phases in compiler? (15)

2. What do you mean by compiler construction tools and explain Parser generator, lexical Analyzer and Scanner generator in detail? (15)

UNIT–II

3. (a) What do you mean by ambiguity in Context free grammar and write the steps to remove the ambiguity in CFG by taking an appropriate example?

(b) Explain TOP down parsing by taking an appropriate example. (15)

4. What do you mean by LALR parser? Design a LALR (1) Parsing table from the following Grammar?

$S \rightarrow AA$

$A \rightarrow aA$

$A \rightarrow b.$ (15)

UNIT–III

5. Explain the following allocation in detail :

(a) Static Allocation,

(b) Heap Allocation,

(c) Stack Allocation,

by taking an appropriate example. (15)

6. What is role of Directed Acyclic Graph (DAG) in Compiler Design? Also write an algorithm for construction of Directed Acyclic Graph in Compiler Design with an example :

$T0 = a + b$ – Expression 1

$T1 = T0 + c$ – Expression 2

$d = T0 + T1$ – Expression 3. (15)

UNIT–IV

7. What do you mean by Optimization and explain machine independent and machine dependent optimization in detail by taking an example? (15)

8. (a) Explain panic mode in detail with the help of an example.

(b) Explain the optimization of basic block, loop and peephole optimization with the help of an example.

(15)

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46166

BT-6/M-24

COMPUTER NETWORKS

Paper–PC-CS-304A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt any *five* questions selecting at least *one* from each unit.

UNIT–I

1. (a) What are the basis on which LAN, MAN and WAN are distinguished? (6)

(b) What are differences between circuit switching and packet switching? (9)

2. (a) What are the characteristics of various transmission media? Explain. (9)

(b) Discuss various layers of OSI-Reference Model. (6)

UNIT–II

3. (a) What is framing? Why is it important? Explain any *two* framing techniques. (9)

(b) Explain reservation and polling schemes for medium access. (6)

4. (a) Explain how token ring system works? Which is the IEEE standard for it? Discuss token management. (9)

(b) Give the working of HDLC protocol. Draw framing structure also of HDLC. (6)

UNIT–III

5. (a) Explain the functioning of IEEE 802.3 protocol. (9)

(b) Describe the working of distance vector routing algorithms. What are the challenges in this protocol. (6)

6. (a) Describe internet addressing in IP and subnetting with suitable examples. (9)

(b) Draw the IPv6 header and explain various fields present. (6)

UNIT–IV

7. (a) Discuss difference between UDP and TCP. (6)

(b) Explain the working of digital signatures in cryptography. (9)

8. (a) Explain the congestion control algorithm of TCP. (9)

(b) Describe the RPC protocol working. (6)

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46167

BT-6/M-24

ADVANCED COMPUTER ARCHITECTURE

Paper : PE-CS-S302A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *five* questions in all, selecting at least *one* question from each unit. All questions carry equal marks.

UNIT–I

1. (a) Compare and contrast different types of parallel architectures, focusing on their classifications, characteristics, and suitability for various computational tasks. (8)

(b) Discuss the types and levels of parallelism in parallel processing, highlighting their significance in improving computational performance and efficiency. (7)

2. (a) Evaluate the performance measures used to assess the effectiveness of pipelines in parallel processing, considering factors such as speedup, efficiency, and resource utilization. (8)

(b) Discuss the architecture and operation of Very Long Instruction Word (VLIW) processors, examining their advantages, limitations, and applications in parallel computing. (7)

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UNIT–II

3. (a) Explain the concept of parallel decoding in superscalar processors. How does it contribute to increasing instruction throughput? (8)

   (b) Describe the technique of superscalar instruction issue and its role in enhancing processor performance. Compare it with scalar instruction issue. (7)

4. (a) Explain the importance of register renaming in superscalar processors. How does it help in avoiding data hazards and improving parallel execution? (8)

   (b) Discuss the branch problem in processors and its impact on performance. Explore various approaches to branch handling, including delayed branching and branch prediction schemes. (7)

UNIT–III

5. (a) Define the concepts of distributed and shared memory in MIMD architectures. Compare and contrast their advantages and disadvantages in terms of scalability and performance. (8)

   (b) Describe the Non-Uniform Memory Access (NUMA) architecture and its implications for scalability. Discuss how NUMA addresses the memory access latency issues compared to UMA. (7)

6. (a) Explain the static connection networks including linear array, ring, barrel shifter, and mesh. Compare their characteristics in terms of scalability, fault tolerance. (8)

(b) Describe the design and operation of multistage networks, omega networks, and butterfly networks. (7)

UNIT–IV

7. (a) Explain the concept of memory hierarchy in modern computer systems. Discuss the role of cache memory in improving performance and the trade-offs involved in designing memory hierarchies. (8)

(b) Describe the cache coherence problem in multi-processor systems. Discuss the challenges associated with maintaining cache coherence. (7)

8. (a) Explain snoopy cache protocols and how they address cache coherence in shared-memory systems. Provide examples of snoopy cache protocols and discuss their strengths. (8)

(b) Discuss the role of directory schemes in maintaining cache coherence in multi-processor systems. Explain how directory-based cache coherence protocols work and compare them to snoopy cache protocols. (7)

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46173

BT-6/M-24

UNIX AND LINUX PROGRAMMING

Paper–PE-CS-S314A

Time : Three Hours] [Maximum Marks : 75

UNIT–I

1. What is the structure of UNIX System and also write the key features of UNIX? (15)

2. (a) What is mean by System users and Regular users.
   (b) Write a command to create user "abc" account with userid as 1002, the home directory as /home/abc and set /bin/bash as his default shell.
   (c) Write a command to delete above mentioned user.
   (d) Write a command to update above "abc" account to use the new default shell — /bin/zsh.
   (e) Write a command to create new group and assign user "abc" to this group. (15)

UNIT–II

3. Write a program in bash shell scripting to display.
   (a) 1st division if entered marks is greater than 80.
   (b) 2nd division if entered marks is greater than 70 and lesss than equal to 80.
   (c) 3rd division if entered marks is greater than 60 and less than equal to 70.
   (d) otherwise fail. (15)

4. What is application of "Perl" Language and write a program in perl language to find average of 20 numbers using array? (15)

UNIT–III

5. What are various modes of "VI" editor. Write a command to
   (a) save and exit.
   (b) copy and paste two lines.
   (c) insert space between two lines. (15)

6. (a) What are Different gcc C-compiler options in Linux?
   (b) Write a command to "MakeFile" including C program of addition of two numbers and sum of 10 numbers in array. (15)

UNIT–IV

7. (a) What do you mean by process and write the command to view the status of running process and stopping the particular process?
   (b) What is use of Firewall and explain the way of working of firewall using linux command? (15)

8. What is Job scheduling and write a command to schedule job to
   (a) create directory at 9:10 pm using AT command.
   (b) remove directory on 13/4/2024 at 10AM using crontab.
   (c) view scheduled jobs in crontab file and delete a particular job. (15)

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46175

BT-6/M-24

SOFT SKILLS AND INTERPERSONAL COMMUNICATION

Paper–OE-CS 302A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt any *five* questions, selecting at least *one* from each unit.

UNIT–I

1. What is Communication? Describe its kinds and importance. (15)

2. What is speaking skill? Describe its main features with appropriate examples. (15)

UNIT–II

3. Discuss the main barriers in the way of communication skill. (15)

4. Discuss the main objectives and characteristics of communication. (15)

UNIT–III

5. Define personality. Discuss its barriers and role in grooming your skill. (15)

6. Illustrate the basic principles for organization skill. (15)

UNIT–IV

7. Define Group Discussion. Illustrate occasion, structure and purpose of good group discussion. (15)

8. Define the job interview. Describe the kinds and stages of job interview. (15)

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47244

BT-7/M-24

SOFTWARE VERIFICATION & VALIDATION AND TESTING

Paper – PE-CS-D403A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *five* questions in all, selecting at least *one* question from each unit. All questions carry equal marks.

UNIT–I

1. (a) Explain the concept of test oracles and their significance in software testing.

(b) Explain the difference between verification and validation, and why both are essential in ensuring software reliability.

2. (a) Discuss some common challenges and limitations encountered in software testing, and how they can be mitigated to improve overall quality assurance.

(b) What criteria are used to develop effective test oracles, and why are they critical in the testing process?

UNIT–II

3. (a) What is Cyclomatic Complexity, and how is it calculated? Discuss its use in test case generation. Use suitable example.

(b) What is Mutation Testing, and how does it assess the effectiveness of test cases in detecting faults? Discuss.

4. (a) Discuss the principles behind Equivalence Class Testing and its application in test case generation.

(b) What are DD-Paths, and how do they aid in understanding the flow of data within a software system?

UNIT–III

5. (a) Discuss the role of regression testing in minimizing the number of test cases and ensuring the stability of software systems over time.

(b) Describe the different levels of testing and their respective objectives in ensuring the quality and reliability of software products.

6. (a) What is slice-based testing, and how does it contribute to the reduction of test cases while maintaining testcoverage?

(b) What strategies and techniques are commonly used in debugging software issues?

UNIT–IV

7. (a) Explain the McCall model of software quality and its components for assessing software quality.

(b) Explain stress testing and its importance in evaluating the performance and robustness of software systems under extreme conditions.

8. (a) What is the Capability Maturity Model (CMM), and how does it help organizations improve their software development processes?

(b) What is ad hoc testing, and how do techniques like buddy testing and exploratory testing fit into this approach?

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47246

BT-7/M-24

NEURAL NETWORKS AND DEEP LEARNING

Paper–PE-CS-D-411A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *five* questions in all, selecting at least *one* question from each unit. All questions carry equal marks.

UNIT–I

1. (a) Explain the various models of artificial neural networks with their corresponding advantages and disadvantages. (7)

(b) Compare and Contrast biological neurons with ANN. Explain. (8)

2. (a) Explain in detail unsupervised learning of clusters. What do you mean by Clustering? Explain with example. (7)

(b) Write short notes :

(i) Biological Neural Network.

(ii) Reinforcement Learning.

(iii) Bias.

(iv) Threshold. (2+2+2+2=8)

UNIT-II

3. (a) Explain the various Architecture of Hopfield Network in detail. How learning process occurs in Hopfield Network? (7)

   (b) What do you mean by Recurrent Auto Associative Memory? Justify with Example. (8)

4. (a) How Counter Propagation Networks Architecture is different from Hopfield Network Architecture? Justify with Example. (7)

   (b) Explain the Architecture, Association, Encoding and Decoding and Stability Consideration for Bidirectional Associative Memory in detail. (8)

UNIT–III

5. (a) With a neat architecture, explain the Boltzmann machine. Explain with Example. (7)

   (b) What do you mean by Maps Architecture? Describe the Kohonen selforganization map in detail. (8)

6. (a) With a neat architecture, explain the learning vector quantization architecture. Explain with an example. (7)

   (b) What do you mean by holographic correlators? Why is it used in the Artificial Neural Network? Explain with a suitable example. (8)

UNIT–IV

7. (a) Describe how deep learning is a kind of representation of learning with the Venn diagram. Explain. (7)

   (b) What do you mean by Deep recurrent Network? Draw the Architecture with steps. (8)

8. (a) Draw and explain the architecture of a convolutional network. (7)

   (b) What is Natural Language Processing (NLP)? Explain the different types of speech recognition in NLP. Explain. (8)

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47249

BT-7/M-24

CYBER LAW AND ETHICS

Paper : OE-CS-401A

Time : Three Hours] [Maximum Marks : 75

Note : Attempt *five* questions in all, selecting at least *one* question from each unit.

UNIT–I

1. Explain the following terms :
   (a) Jurisprudence and Law.
   (b) Real approach.
   (c) Doctrinal Approach. 15

2. (a) How Internet can act as a tool for global access? Explain with the help of some examples. 10
   (b) Explain in brief Hierarchy of Courts. 5

UNIT–II

3. Explain Legal recognition of Electronic records and Digital Signature. 15

4. Explain IT Act, 2000 in detail and write its limitations and Amendments. 15

UNIT–III

5. How patent is different from copyright? Explain with the help of some examples. 15

6. Explain the following terms :
   (a) Domain names.
   (b) Trademark law.
   (c) Civil procedure code. 15

UNIT–IV

7. Explain the need and significance of Cyber Ethics. 15

8. Illustrate the concept of Artificial Intelligence Ethics and explain some ethical issues related to artificial intelligence. 15

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BT–8/M-24 **48245**

CLOUD COMPUTING

Paper–PE–CS–A402A

Time Allowed : 3 Hours] [Maximum Marks : 75

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

UNIT–I

1. How does Cloud computing differ from Cluster computing and Grid computing in terms of Architecture, Resource Management, scalability, and fault tolerance? 15

2. (a) How does the NIST model define Cloud computing, and what are its essential characteristics ? 8

   (b) What are the key principles of distributed computing, and how do they enable Collaborative Processing across multiple interconnected nodes? 7

UNIT–II

3. (a) What is the cloud computing stack, and how does it differ from Traditional Client/Server Architecture? 8

(b) How does cloud computing work, from the perspective of both service providers and consumers, in terms of virtualization, resource allocation, and service delivery? 7

4. (a) Which Protocols are commonly used in Cloud Computing Environments to ensure secure and efficient communication between different components of the Cloud infrastructure? 8

(b) What are the defining characteristics and key features of Infrastructure as a Service (IaaS), and how does it differ from other service models such as Platform as a Service (PaaS) and Software as a Service (SaaS)? 7

UNIT–III

5. (a) What are the Economic benefits of scaling in Cloud computing, and how does the pay-as-you-go model enable organizations to optimize costs while maximizing resource utilization? 8

(b) What are the different types of databases and data stores available in Cloud Computing Environment? 7

6. (a) What features and services does Microsoft Azure offer to Businesses and Developers? 7

(b) What role do Service Level Agreements (SLAs) play in Cloud computing, and how do they differ from Traditional Service Agreements? 8

UNIT–IV

7. How does network-level security play a critical role in protecting Data transmission and Communication within cloud environments, and what Technologies and Protocols are commonly employed to Mitigate Network-based threats? 15

8. (a) What is the role of identity and Access Management (IAM) in Cloud computing? 7

   (b) What is DROPS (Division and Replication of Data in Cloud for Optimal Performance and Security), and how does it enhance both performance and security in Cloud Computing Environments? 8

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BT-8/M-24 **48249**

CYBER SECURITY

Paper–OE-CS-402A

Time Allowed : 3 Hours] [Maximum Marks : 75

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

UNIT–I

1. (a) What is Cyber Extortion? Briefly discuss Sophisticated Cyber Extortion techniques. Write best practices to reduce the risk of Cyber Extortion. 8

   (b) What is the Scope and Nature of Cyber-crimes? Explain different types of Cyber Crimes. 7

2. Discuss the following:

   (a) Explore the strength of Data Encryption Standard (DES). Differentiate between Differential and Linear Crypt Analysis of DES. 8

   (b) Discuss the principles of Block Cipher. Discuss several operations of Block Cipher. 7

UNIT–II

3. (a) Explain Pretty Good Privacy (PGP) & S/MIME. 8

   (b) What is Secure Hash Algorithm (SHA)? Why SHA algorithm is used for? 7

4. (a) Write about Digital Signature Standards (DSS). Discuss proof of digital signature algorithm. 8

(b) Differentiate between Kerberos and X.509. Discuss the main components of Kerberos. How does it work ? 7

UNIT–III

5. (a) Differentiate between Active and Passive Attacks. Discuss the different ways to Prevent Cyber Crime. 8

(b) Explain about Network based Intrusion detection system. 7

6. (a) Explain Secure Electronic Transaction (SET) 8

(b) Define Firewall and describe three types of Firewall. 7

UNIT–IV

7. What is Digital Forensic? Explain the types of Digital Forensic discuss the challenges faced by Digital Forensic. 15

8. (a) Write notes on the following : 8

(i) Digital Signatures and the Indian IT act.

(ii) Architecture of IP Security.

(b) Why do we need Cyber Laws? Discuss the legal perspective of Cyber Crimes and Cyber Security. 7

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BT–8/M-24 **48253**

WEB AND INTERNET TECHNOLOGY

Paper–OE–CS–410A

Time Allowed : 3 Hours] [Maximum Marks : 75

Note : Attempt **five** questions in all, selecting at least **one** question from each Unit. All questions carry equal marks.

UNIT–I

1. (a) Discuss the Evolution of the Internet from its origins to its current state.

   (b) Describe the anatomy of the Internet, including its underlying infrastructure and components.

2. (a) Explore the applications of the Internet, with a focus on e-commerce.

   (b) Give an overview of the process of Designing effective navigation systems for Websites.

UNIT–II

3. (a) Discuss the Hardware and Software requirements for setting up an Internet connection. What factors should be considered when selecting a modem?

(b) Define common terminologies used in networking, including node, host, workstation, bandwidth, network administrator, and network security.

4. (a) Compare and constrast HTML5 with XHTML in terms of syntax and features.

(b) Describe the basics of cascading style sheets (CSS) and their role in Web design.

UNIT–III

5. (a) Discuss the applications of Python in the information industry.

(b) Describe the basic Data types available in Python.

6. (a) Explain functions and scoping in Python, including the definition and invocation of functions.

(c) Describe the creation insertion and deletion of items in Python data structures.

UNIT–IV

7. (a) How are classes used to define abstract data types?

(b) Discuss database operations using MySQL in Python, including connecting to a MySQL database, creating tables.

8. (a) How does exception handling allow Python programs to gracefully handle errors and exceptions at runtime?

(b) Explore the use of regular expressions (REs) in Python for pattern matching and text processing.