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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

MCA

SEM: III - THEORY EXAMINATION (2024- 2025)

Subject: Computer Network

Time: 3 Hours

Max. Marks: 100

General Instructions:

IMP: Verify that you have received the question paper with the correct course, code, branch etc.

1. This Question paper comprises of three Sections -A, B, & C. It consists of Multiple Choice Questions (MCQ's) & Subjective type questions.

2. Maximum marks for each question are indicated on right -hand side of each question.

3. Illustrate your answers with neat sketches wherever necessary.

4. Assume suitable data if necessary.

5. Preferably, write the answers in sequential order.

6. No sheet should be left blank. Any written material after a blank sheet will not be evaluated/checked.

SECTION-A

20

1. Attempt all parts:-

- 1-a. What is internet? (CO1,K1) 1
- (a) A network of interconnected local area networks
- (b) A collection of unrelated computers
- (c) Interconnection of wide area networks
- (d) A single network
- 1-b. _____ is an example of a full-duplex system. (CO1 ,K2) 1
- (a) The keyboard
- (b) CB radio
- (c) The telephone network
- (d) The repeater
- 1-c. Which of the following device is a data link layer device? (CO2 ,K2) 1
- (a) Router
- (b) Switch
- (c) Hub
- (d) Repeater
- 1-d. Routing is used for transfer _____ from one device to another device through network ? (CO2 ,K2) 1
- (a) Data.
- (b) Frame

- (c) Bits
(d) Packet.
- 1-g. _____ is the main purpose of Spanning Tree Protocol (STP)? (CO4 ,K2) 1
(a) To speed up network traffic
(b) To prevent loops in a network
(c) To improve bandwidth
(d) To secure the network
- 1-e. Which one of the following is a type of antivirus program? (CO3 ,K2) 1
(a) Quick heal
(b) Mcafee
(c) Kaspersky
(d) All of the above
- 1-h. Default OSPF administrative distance value in Cisco routers (CO4 ,K1) 1
(a) 90
(b) 100
(c) 110
(d) 120
- 1-f. In order to ensure the security of the data/ information, we need to _____ the data: (CO3,K2) 1
(a) Encrypt
(b) Decrypt
(c) Delete
(d) None of the above
- 1-i. The hierarchical network design model divides networks into these main layers.(CO5 , K1) 1
(a) Access, Distribution, Core
(b) Core, Router, Firewall
(c) Distribution, Application, Transport
(d) Layer 2, Layer 4, Layer 6
- 1-j. The IEEE standard for Wi-Fi technology is identified as this. (CO5 ,K1) 1
(a) IEEE 802.15
(b) IEEE 802.3
(c) IEEE 802.11
(d) IEEE 802.16

2. Attempt all parts:-

- 2.a. Name the layers of the OSI model in order, starting from the bottom. (CO1,K2) 2
2.b. How does a routing table help in packet forwarding? (CO2, K2) 2
2.c. Define Next Generation Firewall. (CO3 ,K1) 2

- 2.d. State the primary purpose of BGP in networking. (CO4,K2) 2
- 2.e. What does the "Ping" command test in network troubleshooting? (CO5, K2) 2

SECTION-B

30

3. Answer any five of the following:-

- 3-a. Compare and contrast LAN, MAN, and WAN in terms of their scope, coverage, and typical use cases.(CO1 , K4) 6
- 3-b. Explain the concept of a network gateway and its role in network communication.(CO1 , K2) 6
- 3-c. Discuss VLAN and how does it work on a switch? (CO2 ,K2) 6
- 3-d. Define Ether Channel, and what are its primary benefits in a network? (CO2 ,K1) 6
- 3.e. Differentiate between Malware and Antivirus. (CO3, K4) 6
- 3.f. Differentiate between Leaky Bucket and Token Bucket.[CO4] 6
- 3.g. Describe how hierarchical design differs from a flat network structure.[CO5] 6

SECTION-C

50

4. Answer any one of the following:-

- 4-a. Explain the structure of an IPv4 address in detail. What are the different classes of IPv4 addresses? Provide examples for each class.(CO1,K2) 10
- 4-b. Explain different types of network topologies. Discuss the advantages and disadvantages of each.(CO1,K2) 10

5. Answer any one of the following:-

- 5-a. Explain the DORA process in DHCP, and how does it facilitate the dynamic assignment of IP addresses to network clients? (CO2 ,K3) 10
- 5-b. Explain the basic structure of a Syslog message. What are the key components of a Syslog message? (CO2, K1) 10

6. Answer any one of the following:-

- 6-a. Explain the various security threats with examples. (CO3, K2) 10
- 6-b. How does network automation differ from traditional network management practices? Discuss its key features and advantages over manual approaches. (CO3, K4) 10

7. Answer any one of the following:-

- 7-a. Discuss the various OSPF states and what each state signifies.(CO4, K2) 10
- 7-b. Compare OSPF with other protocols like RIP and EIGRP, emphasizing aspects like convergence speed, scalability, and efficiency.(CO4,K4) 10

8. Answer any one of the following:-

- 8-a. How does a hierarchical network design improve scalability and manageability in an enterprise network? (CO5 ,K4) 10
- 8-b. Discuss the impact of emerging technologies like IoT and AI on Enterprise Network Architecture.(CO5, K2) 10