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NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA
(An Autonomous Institute Affiliated to AKTU, Lucknow)

MCA

SEM: III - THEORY EXAMINATION (2025 - 2026)

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. The _____ is an example of a simplex device. [CO1,K1]

1

- (a) Repeater
- (b) Tap
- (c) walkie-talkie
- (d) keyboard

1-b. IPv6 address length is:CO1,K2

1

- (a) 32 bits
- (b) 64 bits
- (c) 128 bits
- (d) 256 bits

1-c. Which command is used to see the routing table ? [CO2,K1]

1

- (a) show route.
- (b) show int
- (c) show ip route
- (d) None of the above

1-d. Why is it important to add VLAN identifiers to the frames when they move from one VLAN to another VLAN? [CO2,K2]

1

- (a) To identify which VLAN they belong to
- (b) To identify which switch they belong to
- (c) To identify which host they belong to
- (d) To identify which router they belong to

- 1-e. Packet filtering firewalls are deployed on _____. [CO3,K1] 1
- (a) routers
 - (b) switches
 - (c) hubs
 - (d) repeaters
- 1-f. Which language is used for writing Ansible playbooks? [CO3,K1] 1
- (a) Java
 - (b) Python
 - (c) YAML
 - (d) C++
- 1-g. The default port used by BGP for communication between peers is [CO4,K2] 1
- (a) 80
 - (b) 25
 - (c) 179
 - (d) 443
- 1-h. Command used to enable OSPF on a Cisco router [CO4 K3] 1
- (a) router ospf
 - (b) enable ospf
 - (c) ospf start
 - (d) configure ospf
- 1-i. SSID in a WLAN setup refers to this component.[CO5,K3] 1
- (a) Security Identifier
 - (b) Subnet ID
 - (c) Network Name
 - (d) Encryption Type
- 1-j. In troubleshooting, what is the first step according to the OSI model approach? [CO5,K2] 1
- (a) Check application logs
 - (b) Verify physical connectivity
 - (c) Restart devices
 - (d) Change IP addresses
2. Attempt all parts:-
- 2.a. List some Basic characteristics of Computer Network.[CO1,K2] 2
- 2.b. Differentiate between Root Port and Designated Port in STP. [CO2,K3] 2
- 2.c. Outline the concept of device hardening. [CO3,K2] 2
- 2.d. Analyse the role of Access Control Lists (ACLs) in Quality of Service (QoS) implementation.[CO4,K4] 2
- 2.e. Explain the importance of redundancy in ensuring network reliability. [CO5,K2] 2

SECTION-B

30

3. Attempt all parts:-

- 3.a. Answer any one of the following:-
- 3.a.(i) Compare and contrast the Ring and Star network topologies. Which one is more suitable for modern-day LANs, and why?[CO1,K3] 6
- 3.a.(ii) Show how the Domain Name System (DNS) helps when a user types a website name (like www.google.com) in a browser. Explain the steps of converting the name into an IP address with an example.[CO1,K3] 6
- 3.b. Answer any one of the following:-
- 3.b.(i) Describe how EtherChannel provides redundancy and load balancing in a network. [CO2,K3] 6
- 3.b.(ii) What is the DORA process in DHCP, and how does it facilitate the dynamic assignment of IP addresses to network clients? [CO2,K3] 6
- 3.c. Answer any one of the following:-
- 3.c.(i) Explain the various types of security threats. [CO3,K2] 6
- 3.c.(ii) Differentiate between SQL Injection and Phishing. [CO3,K3] 6
- 3.d. Answer any one of the following:-
- 3.d.(i) What are OSPF cost metrics, and how does OSPF determine the best path for routing?[CO4,K3] 6
- 3.d.(ii) Describe the hub-and-spoke WAN topology and how it differs from a full mesh topology.[CO4.K2] 6
- 3.e. Answer any one of the following:-
- 3.e.(i) Explain the role of virtualization and containerization in cloud networking for IoT.[CO5,K2] 6
- 3.e.(ii) Analyse how the ping command can be used in troubleshooting a network. Provide an example scenario where a network administrator applies the ping command to check connectivity between two devices. [CO5,K3] 6

SECTION-C 50

4. Answer any one of the following:-
- 4-a. Compare the OSI Model with the TCP/IP Model. Discuss the similarities and differences between the two.[CO1,K3] 10
- 4-b. Discuss the differences between IPv4 and IPv6 addressing, including their structure, address space, and notation.[CO1,K3] 10
5. Answer any one of the following:-
- 5-a. Explain the different types of EtherChannel protocol modes (PAgP, LACP, and Static). How do they differ in terms of negotiation and configuration? [CO2,K2] 10
- 5-b. How does a Layer 3 switch perform inter-VLAN routing, and what advantages does it offer over a traditional router? [CO2,K3] 10
6. Answer any one of the following:-
- 6-a. Discuss the terms Confidentiality, Integrity and Availability. [CO3,K2] 10
- 6-b. Write Short Notes on i) Firewall ii) cyber attack iii) Threats iv) Virus. [CO3,K2] 10
7. Answer any one of the following:-
- 7-a. Explain the key parameters involved in Quality of Service (QoS) and how they impact network performance.[CO4,K3] 10

- 7-b. Discuss the main characteristics that distinguish OSPF from other routing protocols.[CO4,K2] 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. Explain the pros and cons of different redundancy techniques and their impact on data integrity and availability.[CO5,K2] 10

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