Printed Page:- Subject Code:- AMICA0603

Roll. No:

NOIDA INSTITUTE OF ENGINEERING AND TECHNOLOGY, GREATER NOIDA

(An Autonomous Institute Affiliated to AKTU, Lucknow)

MCA (Integrated)

SEM: VI - THEORY EXAMINATION (20..... - 20.....)

Subject: Computer Networks

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. Which device operates at the Data Link layer of the OSI model? [CO1,K1] 1

(a) Switch

(b) Router

(c) Hub

(d) Modem

1-b. Why is fiber-optic cable preferred for long-distance communication? [CO1,K2] 1

(a) Cheaper

(b) Less noise

(c) High bandwidth & low loss

(d) Easy to install

1-c. EtherChannel combines multiple physical links into [CO2,K2] 1

(a) One logical link

(b) Many logical networks

(c) Separate VLANs

(d) A broadcast domain

1-d. BPDU stands for [CO2,K1] 1

(a) Bridge Path Data Unit

(b) Bridge Protocol Data Unit

(c) Broadcast Packet Data Unit

(d) Basic Protocol Data Unit

1-e. Ransomware attacks usually demand [CO3,K2] 1

(a) Password reset
(b) Data deletion
(c) Money payment
(d) Social media access

1-f. Key difference between Firewall and IPS is [CO3,K4] 1

(a) IPS stores emails
(b) Firewall blocks attacks
(c) IPS acts before attack
(d) Firewall encrypts data

1-g. Which algorithm does STP use to prevent loops in Ethernet networks? [CO4 ,K1] 1

(a) Shortest Path First
(b) Spanning Tree
(c) Dynamic Path Selection
(d) Distance Vector Algorithm

1-h. Command to set OSPF router ID manually [CO4 ,K1] 1

(a) router-id
(b) ospf router-id
(c) router ospf-id
(d) set ospf-id

1-i. Redundancy in the Core layer is essential to ensure this.[CO5,K2] 1

(a) Network availability and minimal downtime
(b) User authentication
(c) Application layer management
(d) Simplified network topology

1-j. The purpose of a hypervisor in virtualization is to achieve this.[CO5,K2] 1

(a) Increase data center power consumption
(b) Manage and run virtual machines
(c) Disable physical servers
(d) Restrict cloud storage

2. Attempt all parts:-

2.a. What is the purpose of subnetting in IP networks. [CO1,K1] 2

2.b. Write two advantage of link aggregation in networks. [CO2,K2] 2

2.c. Differentiate between stateful and stateless firewalls. [CO3,K3] 2

2.d. State the primary benefit of using MPLS in a WAN network.[CO4,K2] 2

2.e. What is a “loopback test” and when is it used?[CO5,K2] 2

SECTION-B 30

3. Answer any five of the following:-

3-a.	Compare the OSI and TCP/IP models in terms of structure and functionality. [CO1,K3]	6
3-b.	Explain the essential components of data communication in detail. [CO1,K2]	6
3-c.	A network administrator is implementing EtherChannel between two switches. Detail the step-by-step configuration process, highlighting potential compatibility issues and best practices. [CO2,K3]	6
3-d.	Demonstrate the steps required to configure VLANs on a Cisco switch using CLI commands. [CO2,K3]	6
3.e.	Describe the objectives of network security and explain why these are essential for maintaining a secure network environment. [CO3,K1]	6
3.f.	Explain the importance of Spanning Tree Protocol (STP) in preventing network loops in Layer 2 networks.[CO4,K2]	6
3.g.	What are the key challenges and limitations associated with network virtualization?[CO5,K4]	6

SECTION-C 50

4. Answer any one of the following:-

4-a.	List the layers of the OSI model along with their primary functions. [CO1,K1]	10
4-b.	You are given the IP address 192.168.1.45/26. Find the network address, broadcast address, and the number of valid host addresses. [CO1,K3]	10

5. Answer any one of the following:-

5-a.	Compare and contrast the different approaches to implementing inter-VLAN routing: router-on-a-stick, Layer 3 switch routing, and multi-router implementations. [CO2,K3]	10
5-b.	Define Network Address Translation (NAT) and describe the different types commonly implemented in enterprise networks. [CO2,K1]	10

6. Answer any one of the following:-

6-a.	Write Short Notes on i) Denial of Service ii) Man in the middle attack iii) Phishing iv) SQL Injection. [CO3,K2]	10
6-b.	Why is network automation important? And what are the challenges in network automation? [CO3,K4]	10

7. Answer any one of the following:-

7-a.	Explain the concept of multilayer switching and how it differs from traditional Layer 2 switching[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	10

an enterprise network?[CO5,K3]

8-b. Explain how documentation aids in preventing future network issues and assists other team members.[CO5,K3] 10

.