



Seat No. : _____

DK-116

December-2025

5th Year Integrated M.Sc. (CS), Sem.-III

Fundamentals of Networking

(Computer Science)

Time : 2:30 Hours]

[Max. Marks : 50

- Instructions :**
- (1) All questions are compulsory.
 - (2) Write all the sub questions of a particular question in continuation.
 - (3) Write new question on new page.

1. (A) Discuss the difference between OSI and TCP/IP reference models. 5
1. (B) Explain transmission media in detail. 5

OR

1. (A) What is computer network ? Explain its types in detail. 5
1. (B) Explain email protocols- SMTP, POP3 and IMAP4 in detail. 5

2. (A) Explain TCP connection establishment with diagram. 5
2. (B) Differentiate TCP and UDP in detail. 5

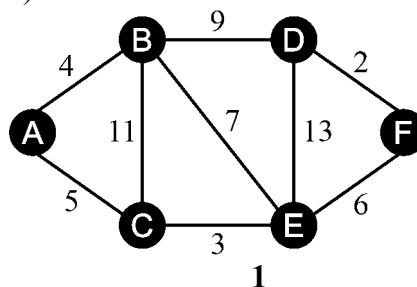
OR

2. (A) Explain UDP services in detail. 5
2. (B) Explain TCP connection termination process with diagram. 5

3. (A) Explain IPv4 with its classes. Explain with example. 5
3. (B) Compare and contrast distance vector routing protocol and link state routing protocol. 5

OR

3. (A) Differentiate IPv4 and IPv6 in detail. 5
3. (B) Find the shortest path tree and the forwarding table for node A (to all nodes) and node E (to all nodes). 5



4. (A) List out error detection techniques. Explain any two techniques with proper example. **5**
4. (B) Given the dataword and the divisor, show the generation of the CRC codeword at both site. Dataword : 101101011 Divisor : $x^2 + 1$. **5**

OR

4. (A) State MAC layer protocols. Explain any two protocols. **5**
4. (B) Calculate the checksum of the following words. Also show that the result is a weighted checksum. $(2C7B)_{16}$ and $(1AE8)_{16}$. **5**

5. Answer any **ten** from the following : **10**

- (1) What is the fundamental purpose of a computer network ?
 (A) Sharing resources (B) Performing calculations
 (C) Enhance security (D) Storing data
- (2) Which device is used to connect different network segments in a computer network ?
 (A) Gateway (B) Switch
 (C) Router (D) Modem
- (3) Short form of : OSI, SMTP
- (4) Short form of: TCP, FTP
- (5) Do stuffing. Consider @ as a flag, A as an esc character and other are data.
- | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| A | N | A | @ | X | # | W | O | @ | R | X | K |
|---|---|---|---|---|---|---|---|---|---|---|---|
- (6) How does the given MAC address 0A:27:AC:4B:EE:0F appear on the line in binary ?
- (7) Perform unstuffing for
 01111110 010101111110 0 0 0 01110 0 0111110111110110 0101101111110
- (8) Name the layer of OSI model in proper sequence.
- (9) Define computer network.
- (10) The size of IPv4 address and IPv6 address are _____ and _____ bits.
 (A) 32, 128 (B) 128, 32
 (C) 32, 64 (D) 64, 32
- (11) Which protocol is used to find the hardware address of a local device ?
 (A) IP (B) ICMP
 (C) ARP (D) RARP
- (12) The method of communication in which transmission takes place in both directions, but only one direction at a time is _____.
 (A) Simplex (B) Half Duplex
 (C) Full Duplex (D) Routing