

**(FOR THE CANDIDATES ADMITTED  
DURING THE ACADEMIC YEAR 2022)**

**ONLY)**

**REG.NO. :**

24UCS205

# **N.G.M.COLLEGE (AUTONOMOUS) : POLLACHI**

## **END-OF-SEMESTER EXAMINATIONS : MAY 2025**

## **B.Sc.Computer Science(Aided & Sf)**

## **MAXIMUM MARKS: 75**

## **SEMESTER : II**

**TIME : 3 HOURS**

### PART - III

24UCS205 – DATA COMMUNICATION AND COMPUTER NETWORKS

## SECTION – A

**(10 X 1 = 10 MARKS)**

**ANSWER THE FOLLOWING QUESTIONS. (K1)**

1. Which type of communication allows data to be sent in only one direction at a time?  
a) Simplex      b) Half-Duplex      c) Full-Duplex      d) Parallel Communication
2. What topology requires the most cable to connect all devices?  
a) Ring Topology      b) Star Topology      c) Mesh Topology      d) Bus Topology
3. What is the primary function of the Data Link Layer in the OSI model?  
a) Routing packets      b) Error detection and correction  
c) Data encryption      d) File transfer
4. Which protocol is used in Ethernet to detect and resolve collisions?  
a) Token Passing      b) CSMA/CD      c) ALOHA      d) CSMA/CA
5. In the X.25 protocol, which of the following layers handles error correction and flow control?  
a) Application layer      b) Data link layer      c) Network layer      d) Transport layer

**ANSWER THE FOLLOWING IN ONE (OR) TWO SENTENCES**

(K2)

6. What is the difference between analog and digital signals in data communication?
7. What is hybrid topology, and why is it used?
8. What role does the Presentation Layer play in data communication?
9. Define the term Distributed Queue Dual Bus (DQDB).
10. What does the term "IP address" refer to in TCP/IP?

**SECTION – B** **(5 X 5 = 25 MARKS)**

**ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.(K3)**

11. a) What is multiplexing? Describe its types with suitable examples.  
**(OR)**  
b) Explain the process of error detection using Cyclic Redundancy Check (CRC).

12. a) Describe the techniques of TDMA, FDMA, and CDMA. Explain how each method allocates resources for communication and provide examples of their applications.  
**(OR)**  
b) Explain the characteristics of different network topologies, highlighting their strengths and weaknesses.

13. a) What are the differences between connection-oriented and connectionless services in the OSI model?

**(OR)**

b) Differentiate between the OSI model and the TCP/IP model.

14. a) What are the main features of a Metropolitan Area Network (MAN)? Provide examples of its applications.

**(OR)**

b) Describe the role and significance of Switched Multimegabit Data Services (SMDS) in networking.

15. a) Describe the key components of the X.25 protocol and its working process.

**(OR)**

b) Explain how ARP works and how it is used in IP communication.

**SECTION – C** **(5 X 8 = 40 MARKS)**

**ANSWER EITHER (a) OR (b) IN EACH OF THE FOLLOWING QUESTIONS.(K4 (Or) K5)**

16. a) Explain the classification of transmission errors in data communication.

**(OR)**

b) Discuss the Stop-and-Wait and Go-Back-N protocols for error recovery. Highlight their advantages and limitations.

17. a) Discuss the characteristics, advantages, and disadvantages of guided and unguided media with suitable examples.

**(OR)**

b) Explain in detail the concepts of circuit switching, packet switching, and message switching.

18. a) Describe the role and functionalities of all seven layers in the OSI model.

**(OR)**

b) Discuss how routing and forwarding are handled at the Network Layer, including the role of IP addressing and routing algorithms.

19. a) Compare and contrast Local Area Network (LAN), Metropolitan Area Network (MAN), and Wide Area Network (WAN) in terms of scope, speed, and applications.

**(OR)**

b) Describe the architecture of Ethernet, including its frame structure and the role of CSMA/CD in collision detection and avoidance.

20. a) Explain the architecture of Integrated Services Digital Network (ISDN) and its advantages. How does it differ from traditional analog communication?

**(OR)**

b) Discuss the TCP/IP protocol suite and explain its layers, including their functions and roles in data communication.