**22CMP211N**

**PSG COLLEGE OF ARTS & SCIENCE**
(AUTONOMOUS)

**MSc DEGREE EXAMINATION MAY 2025**
(Second Semester)

Branch – **COMPUTER SCIENCE**

**TCP/IP PROTOCOL SUITE**

Time: Three Hours Maximum: 75 Marks

**SECTION-A (10 Marks)**
Answer **ALL** questions
**ALL** questions carry **EQUAL** marks (10 × 1 = 10)

| Module No. | Question No. | Question | K Level | CO |
|---|---|---|---|---|
| 1 | 1 | Choose from the following layers of the OSI Reference Model, which is responsible for data formatting and encryption?<br>a) Network Layer b) Transport Layer<br>c) Presentation Layer d) Application Layer | K1 | CO1 |
| | 2 | Relate from the following protocols which is used at the Transport Layer of the TCP/IP model?<br>a) IP b) HTTP c) FTP d) TCP | K2 | CO1 |
| 2 | 3 | Find the primary function of a router in a network.<br>a) To transmit electrical signals<br>b) To direct data packets to their destination based on IP addresses<br>c) To provide Wi-Fi to devices<br>d) To encrypt data for secure transmission | K1 | CO3 |
| | 4 | Show the link-state routing protocol from the following.<br>a) RIP (Routing Information Protocol)<br>b) OSPF (Open Shortest Path First)<br>c) EIGRP (Enhanced Interior Gateway Routing Protocol)<br>d) BGP (Border Gateway Protocol) | K2 | CO4 |
| 3 | 5 | What is the primary purpose of ICMP in a network?<br>a) Routing traffic between devices<br>b) Managing IP address assignment<br>c) Reporting errors and diagnostic information<br>d) Establishing connections between devices | K1 | CO3 |
| | 6 | Infer IGMP primarily manages in a network.<br>a) Multicast group memberships<br>b) Unicast IP address resolution<br>c) Error reporting d) Packet sequencing | K2 | CO3 |
| 4 | 7 | What does RARP (Reverse Address Resolution Protocol) do?<br>a) Maps MAC addresses to IP addresses<br>b) Maps IP addresses to MAC addresses<br>c) Converts domain names to IP addresses<br>d) Converts IP addresses to domain names | K1 | CO4 |
| | 8 | Show from the following which one is **true** about the ARP table?<br>a) It stores IP addresses of remote networks.<br>b) It maps MAC addresses to DNS server IP addresses.<br>c) It maintains a cache of recently resolved MAC addresses and their corresponding IP addresses.<br>d) It stores the IP addresses of web servers. | K2 | CO4 |
| 5 | 9 | What type of communication does UDP provide?<br>a) Connection-oriented b) Full-duplex<br>c) Connectionless d) Reliable communication | K1 | CO5 |
| | 10 | Illustrate the primary characteristic of UDP compared to TCP.<br>a) Connection-oriented b) Reliable data transfer<br>c) Faster data transmission d) Ordered data packets | K2 | CO4 |

**Cont...**

## SECTION - B (35 Marks)

Answer **ALL** questions

**ALL** questions carry **EQUAL** Marks (5 × 7 = 35)

| Module No. | Question No. | Question | K Level | CO |
|---|---|---|---|---|
| 1 | 11.a. | Explain the OSI Reference Model and its Layers. | K5 | CO1 |
| | | (OR) | | |
| | 11.b. | Explain the Functions of the Transport Layer. | | |
| 2 | 12.a. | Elaborate the difference between static and dynamic routing. | K6 | CO1 |
| | | (OR) | | |
| | 12.b. | Elaborate the difference between distance-vector and link-state routing protocols. | | |
| 3 | 13.a. | Discover the main functions of ICMP in IP networking. | K4 | CO3 |
| | | (OR) | | |
| | 13.b. | Analyze the different types of ICMP error messages, and when are they used. | | |
| 4 | 14.a. | Explain RARP and justify how it differs from ARP. | K5 | CO4 |
| | | (OR) | | |
| | 14.b. | Justify the purpose of ARP Cache and explain the happenings when an entry expires. | | |
| 5 | 15.a. | Construct the key features of the User Datagram Protocol (UDP) and differentiate UDP from TCP. | K6 | CO5 |
| | | (OR) | | |
| | 15.b. | Originate the structure of a UDP packet and explain the purpose of its header fields. | | |

## SECTION -C (30 Marks)

Answer **ANY THREE** questions

**ALL** questions carry **EQUAL** Marks (3 × 10 = 30)

| Module No. | Question No. | Question | K Level | CO |
|---|---|---|---|---|
| 1 | 16 | Explain the TCP/IP Model and Its Layers. | K5 | CO1 |
| 2 | 17 | Explain the operation of the Open Shortest Path First (OSPF) protocol, highlighting its key features, stages, and how it ensures efficient routing in a large-scale network. | K5 | CO3 |
| 3 | 18 | Discover the purpose of IGMP in networking and examine the process of it works to manage multicast group memberships. | K4 | CO3 |
| 4 | 19 | Construct the working Principles of ARP. | K6 | CO4 |
| 5 | 20 | Originate the key characteristics of User Datagram Protocol (UDP) and discuss how it differs from Transmission Control Protocol (TCP) in terms of functionality, reliability, and use cases. | K6 | CO4 |

Z-Z-Z END