No. of Printed Pages : **2**

Sl. No.

# C2-R4 : ADVANCED COMPUTER NETWORKS

**NOTE :**

**1. Answer question 1 and any FOUR from questions 2 to 7.**

**2. Parts of the same questions should be answered together and in the same sequence.**

**Total Time : 3 Hours** **Total Marks : 100**

**1.** (a) What is the layered structure of protocol architecture of computer networks ? List the major disadvantages with the layered approach to protocols.

(b) Explain the various delays suffered by a packet within the communication subnet.

(c) Determine the maximum throughput in Pure ALOHA system.

(d) Distinguish between Transmission Control Protocol (TCP) and User Datagram Protocol (UDP).

(e) Differentiate between Flow Control and Congestion Control.

(f) What is a virtual path in ATM ? List its advantages.

(g) Briefly explain Multi-Protocol Label Switching (MPLS) and its applications. **(7x4)**

**2.** (a) What is Multiplexing ? Discuss different types of multiplexing schemes in telecommunications and computer networks.

(b) What is CSMA ? Discuss 1-persistent, non-persistent and p-persistent CSMA protocols.

(c) Explain IPv6 packet header. Compare IPv6 and IPv4 with various critical features. **(6+6+6)**

**3.** (a) Explain closed queuing networks and state Jackson's theorem for closed networks.

(b) What is splitting algorithm ? Explain First Come First Server (FCFS) splitting algorithm.

(c) Discuss UNI (User-Network Interface) cell format of ATM. **(6+6+6)**

**4.** (a) Define constant bit rate (CBR), real time variable bit rate (rt-VBR), non-real time variable bit rate (nrt-VBR), and unspecified bit rate (UBR).

(b) Discuss the Jacobson's algorithm for computing retransmission time out to control congestion in TCP.

(c) How does Integrated Service Architecture (ISA) manage QoS over IP networks ? What are the various components of ISA ? **(6+6+6)**

**5.** (a) Explain the features of Session Initiation Protocol (SIP).

(b) What is VPN ? Differentiate between a site-to-site VPN and a Remote Access VPN.

(c) Explain Distance-vector and Link state Multicast routing. **(6+6+6)**

**6.** (a) What is Remote Procedure Call (RPC) ? List the sequence of events during RPC.

(b) Discuss the operation of Voice over IP (VoIP) protocol. How is delay jitter controlled in it ?

(c) What is Streaming Media ? List the advantages of Streaming Media. Discuss the steps in sending out content via streaming. **(6+6+6)**

**7.** Write short notes on the following :

(a) Multicast backbone (MBONE).

(b) Random Early Detection (RED).

(c) Real-Time Transport Control Protocol (RTCP). **(6+6+6)**

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