C2-R4: ADVANCED COMPUTER NETWORKS

NOTE:

1. **Answer question 1 and any FOUR from questions 2 to 7.**
2. **Parts of the same question should be answered together and in the same sequence.**

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

1.

a) List out the features of ATM.

b) Explain Pure ALOHA and Slotted ALOHA.

c) Explain RTP header format in depth.

d) Explain Three-Way Handshaking (connection establishment) in TCP.

e) Differentiate between PVC and SVC connection used in ATM networks.

f) Differentiate OSI reference model and TCP/IP model.

g) Four 1-kbps connections are multiplexed together. A unit is 1 bit. Find (i) The duration of 1 bit before multiplexing, (ii) the transmission rate of the link, (iii) the duration of a time slot (iv) the duration of a frame.

(7x4)

2

a) Explain various types of Carrier Sense Multiple Access Protocols (CSMA).

b) There are several related protocols which support the real-time traffic over Internet. Explain any two protocols which support multimedia networking purpose.

(9+9)

3.

a) A slotted ALOHA network transmits 200-bit frames using a shared channel with a 200-kbps bandwidth. Find the throughput if the system (all stations together) produces

1000 frames per second
500 frames per second
250 frames per second

b) Four channels are multiplexed using TDM. If each channel sends 100 bytes/s and we multiplex 1 byte per channel, show the frame travelling on the link, the size of the frame, the duration of a frame, the frame rate, and the bit rate for the link.

(9+9)

4.

a) Remote Procedure Call (RPC) is an inter-process communication that allows a computer program to call a subroutine or procedure which executes in another address space. List the sequence of events during RPC.

b) Write a short note on FCFS splitting algorithm.

(9+9)

5.

a) Protocol-Independent Multicast (PIM) is a family of multicast routing protocols for Internet Protocol (IP) networks. Explain PIM in detail.

b) Random early detection (RED), also known as random early discard or random early drop, is an active queue management algorithm. Explain RED design goals and algorithm.

(9+9)

6.

a) An ATM cell header can be one of two formats: UNI or the NNI. The UNI header is used for communication between ATM endpoints and ATM switches in private ATM networks. The NNI header is used for communication between ATM switches. Write and explain fields of UNI and NNI frame format.

b) Compare IPv4 options field and IPv6 Extension headers.

(9+9)

7.

a) How ATM works? List out various types of services provided by ATM.

b) Explain various types of AALs (ATM Adaptation Layers).

(9+9)