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) Explain ATM cell header format.

b) Differentiate between Flow Control and Congestion Control.

c) Explain Queuing System.

d) Explain the use of RED and its effect on traffic shaping.

e) Briefly explain Multi-Protocol Label Switching (MPLS) and its applications?

f) Briefly explain the features of Session Initiation Protocol (SIP).

g) Differentiate between Multiplexing and Demultiplexing.

(7x4)

2.

a) What is VOIP? List the requirements of VOIP. Also, discuss the Advantages and Disadvantages of VOIP.

b) Write Short note on:

i) Continuous State Leaky-Bucket Algorithm.

ii) Multicast BackbONE (MBONE)

(9+9)

3.

a) What is OSI Model? Explain the functions and protocols and services of each layer?

b) A 1 km long, 10Mbps CSMA/CD LAN has a propagation delay of 5 usec per km. Data frames are 256 bits, including a 32 bits of overhead checksum, header, etc.). The first bit slot after a successful transmission is reserved for the receiver to capture the channel and send a 32 bit ACK frame. What is the maximum effective data rate for actual data (excluding overhead) assuming there are no collisions?

(12+6)

4.

a) What is IP addressing? How it is classified? How is subnet addressing performed?

b) Explain the following:

i) Transmission Control Protocol (TCP)

ii) User Datagram Protocol (UDP)

(10+8)

5.

a) What is Asynchronous Transfer Mode? List main services provided by AAL(ATM Adaptation Layer). Briefly explain various ATM Adaptation Layers.

b) How TCP performs Congestion Control? What is the role of Jacobson's algorithm and Karn's algorithm in TCP congestion control? Explain in detail.

(9+9)

6.

a) Why IPV6 is required? Do we need IPV6 extension header if IPV6 have a fixed header? Justify your answer with block diagrams of required headers.

b) What is Networks of Queues? Compare Open and Close queuing networks. Where do we apply Jackson's Theorem? Explain briefly.

(9+9)

7.

a) What are Reverse Path Broadcasting (RPB) and Reverse Path Multicasting (RPM)? Discuss, how RPB and RPM operates? List the benefits and limitations of both.

b) What is Streaming Media? List advantages of Streaming Media. Discuss the steps in sending out content via streaming.

(9+9)