

Time: Three hours

Maximum: 80 Marks

Answer **ALL** questions

**PART A - (8 X 2 = 16 marks)**

1. In Go-Back-N window, entire packets are re-transmitted even though some arrived safely, whereas in selective repeat window sender undergoes re-transmission.
  - a) Packet which are not lost
  - b) Only those packets which are lost or corrupted
  - c) Packet from starting
  - d) All the packets
2. Port numbers are used in sender and receiver side machines to perform
  - a) Multiplexing and Demultiplexing
  - b) Demultiplexing and Multiplexing
  - c) Routing and Forwarding
  - d) Error and Flow control
3. The S-bit is set in MPLS shim header if
  - a) Label follows in the stack
  - b) Valid label in the stack
  - c) Invalid label in the stack
  - d) No label follows in the stack
4. What is used on PE router for isolating potential overlapping routing information between different users in MPLS layer 3 VPN?
  - a) VC ID's
  - b) VRF's
  - c) Route targets
  - d) Pseudo wire classes
5. Mention the challenges in implementation of openflow.
6. A channel has a data rate of 4 kbps and a propagation delay of 20 ms. For what range of frame sizes does stop and wait give an efficiency of at least 50% ?
7. What are characteristics of Laissez Faire Approach over Traffic congestion ?
8. Identify positive and negative effects of Network Externalities.

**PART B - (4 X16 = 64 marks )**

09. (a) Compute the fraction of the bandwidth that is wasted on overhead (headers and retransmissions) for a protocol on a heavily loaded 50 Kbps satellite channel with data frames consisting of 40 bits header and 3960 data bits. Assume that the signal propagation time from the earth to the satellite is 270 msec. ACK frames never occur. NAK frames are 40 bits. The error rate for data frames is 1% and the error rate for NAK frames is negligible. **(16)**

**(OR)**

- (b) (i) How does flow control in TCP help with congestion control and explain how error control is carried out in TCP. **(10)**
- (ii) Compare switched and shared media networks in terms of scalability and performance issues. **(6)**
10. (a) Implement and explain different scheduling and dropping policies in Best Effort model and Guaranteed Service Model. **(16)**

**(OR)**

- (b) (i) How differentiated services acts as an low-overhead tool to support various services based on performance issues in internet? **(8)**
- (ii) Calculate RTT for RTCP traffic and explain RTCP header with different packet formats. **(8)**
11. (a) What is the procedure for designing and deploying MPLS based VPN? How overlay networks guarantees convergence and facilitates deterministic search? **(16)**

**(OR)**

- (b) Identify the functionality of the various inter networking devices and mention their specifications to handle the current network traffic. **(16)**
12. (a) (i) Discuss in detail about network virtualization and the necessity for the separation of control and data plane in SDN. **(12)**
- (ii) Identify how network function virtualization had improved efficiency of networks in terms of bandwidth utilization and latency. **(4)**

**(OR)**

- (b) Illustrate the configuration and working of different stages in Open Shortest Path First Protocol in detail with suitable diagrams. **(16)**