

Con. 3123-09.

VR-4158

(REVISED COURSE)

(3 Hours)

[Total Marks : 100

N.B.: (1) Question No. 1 is compulsory.

(2) Attempt any **four** questions out of the remaining **six** questions.(3) Assume any **suitable data** whenever **required** but justify the **same**.1. Answer any **four** questions :—

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- (a) What are the transmission impairments ? Explain each briefly.
- (b) Compare Go-back-N ARQ and selective repeat ARQ.
- (c) What are the advantages of statistical TDM over synchronous TDM ?
- (d) Discuss difference between repeaters, bridges, routers and gateway.
- (e) A message is broken up into three packets. Discuss the transmission of the packets using virtual circuit approach to packet switching.

2. (a) Draw the layered OSI network architecture. Explain the function of each layer and show the path of actual and virtual communication between the layers. 10

(b) Explain with the neat diagrams how U-frames can be used for connection establishment and connection release between two neighbouring nodes A and B. Also explain exchange of information between the same nodes using piggybacking without and with error. 10

3. (a) With a suitable sketch explain the connection phases in point to point protocol, also explain supported sets of protocols to make a ppp a powerful protocol. 10

(b) What are the conditions to be satisfied by a good CRC generator polynomial ? 10

For P = Predetermined divisor = 110101 (LSB) and D = K-bit block of data = 1010001101 (LSB)

Find the CRC.

4. (a) Explain X DSL technologies and its applications. Explain in detail ADSL. 10

(b) Draw a three-stage space-division switch for $N = 20$, $n = 5$ and $k = 2$ and estimate the no. of crosspoints required. If the above switch is to be made non-blocking, derive the expression for the condition to be satisfied, also calculate the minimum crosspoint required for non-blocking. 10

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5. (a) Calculate the maximum link utilisation of the network specified below for the following cases. 6

- (i) stop-and-wait flow control
- (ii) Sliding window flow control with window sizes of 7 and 15.

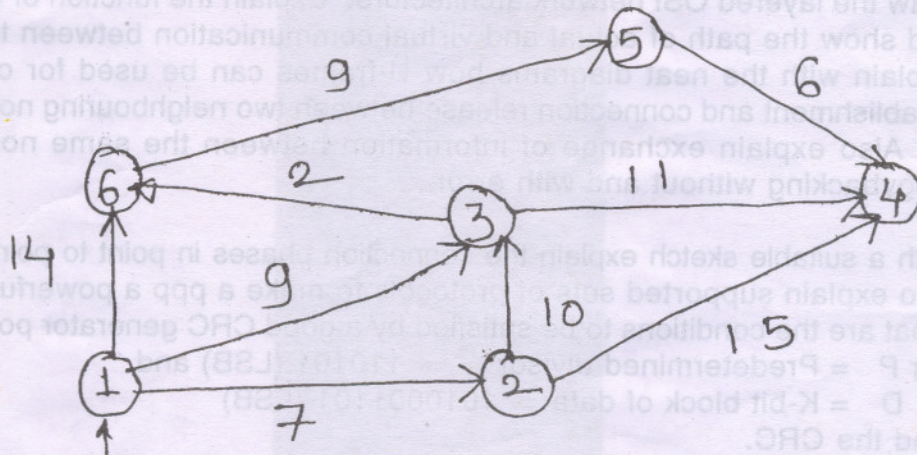
Link specifications :—

Frame length	= 1200 bits
Velocity of propagation	= 2×10^8 m/sec.
Link distance	= 16 km
Data rate	= 20 mbps.

- (b) Why is congestion control required ? List the congestion control techniques used in 6

- (i) Packet switching
- (ii) Frame relay.

- (c) Apply Dijkstra's and Bellman Ford Algorithm to the given network and find the least cost path between the source node 1 to all other nodes :— 8



Source node

6. (a) How is an ATM virtual connection identified ? 5
- (b) Explain LAN protocol architecture with IEEE 802 reference. Sketch the general MAC frame format and the LLC PDU structure. 10
- (c) Explain ISDN channels. 5

7. Write short notes on the following : (any four) :— 20

- (a) Token Ring
- (b) ISDN user interface
- (c) ATM adaptation layer
- (d) SS7 architecture
- (e) CSMA/CD.