(d) Explain, with neat diagrams propagation of light through (i) step-index multimode, (ii) Graded index multimode and (iii) single mode fibre. Also show the output light pulse with respect to input light pulse when passed through each of the above three fibre types.

3+3=6

OR

1 (a) Determine height of an antenna for a TV station that must be able to reach customers upto 80 km away.

2

(b) Define the terms : (i) sampling error and (ii) quantization erorr. Also discuss the effects of errors and how to overcome error (S) ?

4

(c) A transmitter is transmitting at 1 kbps. What will happen if the receiver clock is (i) slower and (ii) faster by 1% with respect to the transmitter when a 1000 bit frame is transmitted. Also suggest methods to overcome the problem.

3+3=6

(d) Draw neat sketches showing different wireless propagation modes. (No description). Mention the range of frequencies for each mode.

4

UNIT - II

2 (a) Suppose we want to transmit the message 11001001 and protect it from errors using the CRC polynomial x^3+1. Find (i) the trnsmitted word (ii) suppose the leftmost bit of the message is inverted due to noise on the transmission link. What is the result of receiver's CRC calculation ? How does the receiver know that an error has occurred ?

8

(b) Assume that the sender and receiver has both their window size equal to 3 and the N^{th} frame is assigned a sequence number N and S. What will happen if the received frame contains a sequence number = 0 when 0 is the receiver's window ? Discuss all possibilities.

8

OR

2 (a) Compute the minimum number bits to be used for sequence number in a sliding window protocal for a 1 Mbps point-to-point link with one way latency of 1.25 seconds. Assume each frame carries 1 kb of data.

6