Digital and Data Communication
(IT-353, DEC-06)

Note: Attempt any five questions

1. a) Explain various factors which may degrade the signal quality during data communication.
   b) Is the transmission medium a part of the physical layer?
   c) What is the purpose of cladding in an optical fiber? Discuss its density relative to core?
2. a) What S/N ratio is required to achieve a bandwidth efficiency of 5.0 for ASK, FSK, PSK and QPSK? Assume that the required bit ratio is 10^{-6}.
   b) Why should PCM be preferable to DM for encoding signals that represent digital data? Explain.
3. a) Draw a timing diagram showing the state of all EIA-232 leads between DTE-DCE pairs during the course of a data call on the switched telephone network.
   b) Suppose that the sender and receiver agree not to use any stop bits. Could this work? If so explain any necessary conditions.
4. a) What is the purpose of using Modulo-2 arithmetic rather than Binary arithmetic computing an FCS? Explain.
   b) For P=110011 and M=11100011. Find CRC.
   c) What are the differences between Forward and Backward error corrections? Explain.
5. a) In a stop and wait ARQ, the bandwidth of the line is 1 Mbps, and bit takes 20 ms to take around trip. What is the Bandwidth delay product? If the system data frames are 7000 bits in length, what is the utilization of the link?
   b) Explain frame structure of HDLC. Is Bit stuffing is needed for control field? Explain.
6. a) Four channels (digital), each transmitting at 1 Mbps, use a satellite channel of 1 MHz. Design an appropriate configuration using FDM.
   b) Explain TDM. Why is it that the start and stop bits can be eliminated when character interleaving is used in synchronous TDM?
7. a) Explain various satellites parameters. Also explain various types of satellites on the basis of the location of orbit.
   b) Bring out important differences between Fixed assign multiple access and 'Demand assign multiple access' in detail.
8. Write short notes on:
   a) Bipolar-AMI
   b) V-35 Interface
   c) Serial Controller 85C30
   d) CDMA