

S.E (I.T.) (Second Semester) EXAMINATION, 2010

DATA COMMUNICATION

(2008 COURSE)

Time : Three Hours

Maximum Marks : 100

N.B. :— (i) Answer any 3 questions from each Section.

(ii) Answers to the two Sections should be written in separate answer-books.

(iii) Neat diagrams must be drawn wherever necessary.

(iv) Figures to the right indicate full marks.

(v) Assume suitable data, if necessary.

SECTION I

1. Attempt any *two* questions from the following : [8 marks each]

(a) Explain the various transmission impairment in data communication.

(b) State the Nyquist theorem and explain Shannon capacity and solve the given example.

Example : Calculate the channel capacity for a noisy channel having Bandwidth = 5 kHz and SNR = 0 using appropriate formula.

(c) What is PCM ? Describe it in detail with the help of diagram.

Or

2. Attempt any *two* questions from the following : [8 marks each]
- (a) Explain the block coding with 8B/10B scheme as an example.
 - (b) Compare the serial and parallel transmission modes for data communication.
 - (c) Describe in brief the TCP/IP protocol stack along with the layered representation.
3. (a) Draw and explain the Amplitude modulation generation. Draw frequency domain representation of AM. State the formula for Bandwidth calculation of AM and list out advantages of AM. [10]
- (b) Explain in detail TDM and Statistical TDM. Mention advantages and disadvantages. [8]

Or

4. (a) What is constellation pattern ? Describe it in detail with representation technique details. Draw constellation patterns for the ASK, PSK, QPSK and 4-QAM. [10]
- (b) State the principle of spread spectrum and explain FHSS in detail. [8]
5. Attempt any *two* questions from the following : [8 marks each]
- (a) Compare any two types of the guided transmission media.
 - (b) What is switching ? Explain in detail Packet switch technique along with advantages and disadvantages of it.
 - (c) What is HDLC ? Explain with the help of its frame format. Describe all fields in detail.

Or

6. Attempt any *two* questions from the following : [8 marks each]
- (a) Explain fiber optic cable along with its constructional detail, advantages and disadvantages.
 - (b) Describe in detail circuit switching techniques.
 - (c) Explain the terms ADSL, ADSL Lite, HDSL, SDSL.

SECTION II

7. Attempt any *two* questions from the following : [8 marks each]
- (a) Discuss in detail CRC technique with *one* example. List out advantages of CRC over other methods.
 - (b) Explain in detail Go-Back-N Automatic Repeat request protocol.
 - (c) What is checksum ? Describe in detail internet checksum method with suitable example.

Or

8. Attempt any *two* questions from the following : [8 marks each]
- (a) Explain in detail the selective repeat automatic repeat request protocol.
 - (b) Define error correction, error detection and Hamming Distance. Calculate Hamming distance for followed examples :
 - (i) d(000,010)
 - (ii) d(011, 110)
 - (iii) d(101, 011)
 - (iv) d(000,101)
 - (c) Draw and explain PPP protocol stack.

9. (a) Explain in detail CSMA/CD. State the advantages over CSMA. [8]
- (b) Describe different controlled access protocol mentioned below in short : [10]
- (i) Reservation
- (ii) Polling
- (iii) Token passing.

Or

10. (a) Draw and explain the MAC frame format of 802.3. Explain each field in detail. [10]
- (b) Compare and contrast FDMA and CDMA in detail. [8]
11. Attempt any *two* questions from the following : [8 marks each]
- (a) Draw the simple network using SONET equipment and explain STS Multiplexer/Demultiplexer, ADM, Section, Path, Regenerator in detail.
- (b) Draw and explain BUS Backbone Network.
- (c) Write a short note on Bridges.

Or

12. Attempt any *two* questions from the following : [8 marks each]
- (a) Enlist different connecting device in the network and explain any *two* in detail.
- (b) Draw and explain SONET layers in detail.
- (c) Draw and explain Star Backbone Network in detail.