T.E. (Computer) (Sem. – I) Examination, 2010
DATA COMMUNICATIONS (2003 Course)

Time : 3 Hours　　　　　　　　　　　　　　　　　　　　　Max. Marks : 100

Instructions : *1) Answer any **three** questions from **each** Section.*
2) Answer Q. 1 or Q. 2, Q. 3 or Q. 4, Q. 5 or Q. 6 from Section 1.
3) Answer Q. 7 or Q. 8, Q. 9 or Q. 10, Q. 11 or Q. 12 from Section 2.
*4) Answers to the two Sections should be written in **separate** books.*
*5) **Neat** diagrams must be drawn **wherever** necessary.*
*6) Black figures to the **right** indicate **full** marks.*
*7) Assume suitable data, if **necessary**.*

SECTION – 1

1. a) What is Amplitude Modulation ? Explain the working of switching modulator for DSB-SC. 　　8

　b) Explain the terms Modulation Index, Bandwidth of AM wave with suitable formula. 　　4

　c) Explain with neat block diagram the SSB generation using phase shift method. 　　6

OR

2. a) What is Quadrature Amplitude Multiplexing ? What are its advantages ? Where it can be used ? 　　8

　b) Explain the need and importance of Reemphasis and Deemphasis. 　　4

　c) Describe in brief with neat waveforms ASK, FSK and PSK modulation. 　　6

3. a) Explain in short what is PWM and PPM along with its advantages. 　　6

　b) Explain in short what is Aliasing effect ? How to overcome it ? 　　6

　c) Explain the sampling theorem. Comment on the effect of sampling frequency on reconstruction of the signal. 　　4

OR

4. a) Explain any 4 line coding techniques with suitable example. 8

   b) Differentiate between Ideal sampling and Flat top sampling. 4

   c) Explain in short what is Inter Symbol Interference (ISI). 4

5. a) What is the significance of Quantization in A/D Conversion ? What is Uniform Quantization ? What is the drawback associated with it and how to overcome this drawback ? 10

   b) Explain what are the various advantages of Digital communication over Analog Communication ? 6

OR

6. a) Explain in detail what is delta modulation ? Draw diagram for Delta Modulator and Demodulator. What are its advantages over PCM ? 10

   b) Draw and explain schematic diagram of T1 carrier system. What is the Data rate supported ? 6

SECTION – 2

7. a) Describe the following terms : 6

   i) Hamming weight of a code word

   ii) Hamming distance

   iii) Code efficiency.

   b) Using Shannon's theorem compute the maximum bit rate for a channel having Bandwidth 3100 Hz and a signal to noise ratio 20dB. 5

   c) If the 7 bit Hamming code word is received by a receiver is 1011011. Assuming the even parity state whether the received code word is correct or wrong. If wrong locate the bit in error. 5

OR

8. a) What is ARQ ? Explain in short Go back n mechanism. What are its drawback ? 8

   b) Explain with suitable example how CRC checksum computation helps in error detection. 8

9. a) Comment on the significance of the various channels used in ISDN. Also specify the data rate supported by these channels.   6

b) List the important features of ATM. Also explain the ATM reference model.   6

c) What is Frame relay ? Differentiate Frame relay with ATM.   6

OR

10. a) What is Broadband ISDN ? How it is different than ISDN ? What types of services it can support ?   6

b) Draw and explain the ATM cell structure.   6

c) Explain the following terms with respect to ISDN   6
   a) NT1
   b) TA.
   c) TE1

11. a) Comment on the TCP/IP protocol Stack. Explain the importance of TCP and UDP protocols.   8

b) Explain in short why star topology is generally preferred while implementing a Network ? What advantages it has over other topologies ? Which are the devices used in this topology ?   8

OR

12. a) Differentiate between Circuit Switching and Packet Switching.   4

b) Explain in short the working of CSMA/CD protocol used in Ethernet.   6

c) Comment on the various transmission media in use in networking.   6

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