Q.P. Code : 77089

(2 1/2 Hours) [Total Marks : 75

N.B. : (1) **All** questions are **compulsory.**
(2) **Figures** to the **right** indicate **marks**
(3) Illustrations, in-depth answers and diagrams will be appreciated
(4) Mixing of sub-questions is not allowed.

Q - 1 Attempt the following (any Three) 15

(A) Discuss different components of data communication system.

(B) How hop-to-hop delivery works at data link layer?

(C) If a periodic signal is decomposed into five sine waves with frequencies of 100, 300, 500, 700 and 900Hz. what is its bandwidth? Draw the spectrum assuming all components have a maximum amplitude of 10v.

(D) Discuss in brief bipolar line encoding scheme. Draw the signal representation for the following digital signal for AMI and pseudoternary bipolar line encoding scheme.

Signal :- 010010

(E) We have an available band width of 100 KHz. which spans from 200 to 300 KHz. what should be the carrier frequency and the bit rate if we modulated our data by using FSK with d = 1?

(F) Write a short note on QPSK. (Quadrature Phase shift keying)

Q - 2 Attempt the following (any three) (15)

(A) Define multiplexing. Discuss in detail working of frequency division multiplexing.

(B) What is guided transmission media? Discuss the characteristics of twisted pair cable with neat labeled diagram of its physical representation.

(C) Why circuit switched network is called as circuit switched? Discuss its different phases which help in communication between two nodes.

(D) "Its datagram network sometimes referred to as connection less network"? Justify your answer with its working.

(E) Write a short note on ADSL [Advanced Digital Subscriber Line] technology.

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(F) What are microwave? Describe some characteristics of microwave propagation.

Q.3 Attempt the following (any three) **15**

(A) How single bit error differs from burst error? How one can correct it? Explain with example.

(B) Define Hamming distance. Calculate minimum Hamming distance for the following.

1. d(0000, 010111)
2. d(10101, 11110)
3. d(101, 110)
4. d(011, 101)

(C) What are cyclic codes? Discuss the working of CRC encoder.

(D) What is noiseless channel? Discuss the working of anyone protocol for noiseless channel.

(E) How selective Repeat ARQ differs from Go-Back-N ARQ.

(F) With neat labeled diagram discuss the frame format of HDLC.

Q.4 Attempt the following (Any three) **(15)**

(A) How random access protocol works? List all the protocols in this category.

(B) "Is CDMA better then FDMA and TDMA"? Justify you answer.

(C) What is the difference between a unicast, multicast and broad cast addresses? Explain with suitable example.

(D) Discuss the hidden station problem and it's solution in real time.

(E) Define repeater and amplifier. How repeater differs from an amplifier?

(F) In cellular telephony, what is the principal for frequency reuse? Which reuse factor is better - Frequency reuse factor 4 or factor 7?

Q.5 Attempt the following (Any three) **(15)**

(A) Differentiate between parallel transmission mode and serial transmission mode.

(B) Write a short note on Direct Sequence Spread Spectrum.

(C) Define piggy backing and its usefulness.

(D) How piconet is implemented in bluetooth?

(E) Discuss any one analog to analog modulation technique.

(F) Write a short note on backbone network.

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