(2 ½ 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.

Q1. Attempt the following (any THREE): (15)

(A) Define data communication? List and explain five components of digital data Communication?

(B) Describe Ring topology.

(C) Explain the Network layer of TCP/IP Protocol?

(D) Explain the functions of Physical layer of OSI Model

(E) Write short note on Signal-to-Noise Ratio (SNR).
Solve: The power of a signal is 10 W and the power of the noise is 1 W; what will be the value of SNR?

(F) Explain Amplitude Shift Keying and Frequency Shift Keying digital to analog conversion techniques.

Q2. Attempt the following (any THREE): (15)

(A) Define DSSS and explain how it achieves bandwidth spreading.

(B) Give one line description of Characteristics, Types, Advantages, Disadvantages and Applications of Coaxial cable.

(C) Write note on various types of switch networks.

(D) Describe the process of wavelength-division multiplexing and demultiplexing.

(E) With a help of diagram explain the components of packet switches.

(F) Give number of crossbars required at each stage of three-stage switch where N=200, k=4 and n=20. Also calculate the total number of crosspoints required.

Q3. Attempt the following (any THREE): (15)

(A) Explain the following terms and show the relation among them.
a. Data word
b. Code word
c. Redundancy

(B) Explain the error detection process used by CRC.

(C) What is Hamming distance?
What is Hamming distance for each of the following code word?
a. d(10000,01000)
b. d(10101,10010)
c. d(1111,1111)
d. d(0000,0000)

(D) Explain the control frames of HDLC.

(E) What is Byte Stuffing and how it is implemented?
(F) How data flow is controlled in Stop and Wait-ARQ?

Q4. Attempt the following (any THREE): (15)
(A) Write short note on Frequency Division Multiple Access (FDMA).
(B) COMPARE 1-persistent, non-persistent, p-persistent?
(C) Explain 10Base2-Thin Ethernet.
(D) Explain hidden and expose terminal problem.
(E) Explain the piconet and scatternet network architectures of Bluetooth.
(F) Write the Spanning Tree algorithm.

Q5. Attempt the following (any THREE): (15)
(A) Distinguish between LAN and WAN?
(B) Explain BNC Connector.
(C) Define Error. Explain Single bit and Burst error.
(D) What is Internet? Explain the hierarchy of internet service providers?
(E) Write any three advantages and two disadvantages of optical fiber cable.
(F) Name the layer/s at which the following network device operates:
  a) Router
  b) Bridge
  c) Repeater
  d) Hub
  e) Switch

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