(2½ hours)

Total Marks: 75

N. B.: (1) **All** questions are **compulsory**.
(2) Make **suitable assumptions** wherever necessary and **state the assumptions** made.
(3) Answers to the **same question** must be **written together**.
(4) Numbers to the **right** indicate **marks**.
(5) Draw **neat labeled diagrams** wherever **necessary**.
(6) Use of **Non-programmable** calculators is **allowed**.

1. Attempt *any three* of the following: **15**

a. Explain basic communication system with block diagram.
b. Discuss parallel transmission and serial transmission.
c. List and explain the function of each layer of ISO's OSI model with neat diagram.
d. Explain the process of Amplitude Shift Keying with the data '**10110**'.
e. Differentiate between asynchronous transmission and asynchronous transmission.
f. Show Unipolar NRZ and Polar RZ encoding pattern for bit stream '**10110100101**'

2. Attempt *any three* of the following: **15**

a. Draw and explain Model of Spread Spectrum in digital communication system.
b. What are the problems in connecting multiple devices? How switching techniques overcome these problems?
c. What are different duties assigned to data link layer of ISO's OSI model? Explain in brief.
d. Explain basic ARQ system with its type.
e. Generate the CRC code for message '**1001101010**'. Give generator polynomial. $g(X)=X^4 + X^2 + 1$
f. Compare twisted pair, co-axial and fiber optic cable.

3. Attempt *any three* of the following: **15**

a. Write a short note on Framing and explain any 2 framing methods with example.
b. Explain concept of sliding window with movement of both sender and receiver window.
c. Explain S-frame and U-frame of HDLC with format.
d. Draw and explain flow of ALOHA protocol and compare Pure ALOHA with Slotted ALOHA.
e. Explain the architecture of Bluetooth with all its layer.
f. Write a short note on
   (a) GPS
   (b) Geostationary Satellite.

4. Attempt *any three* of the following: **15**

a. What do you mean by forwarding? Explain Next hop method and Route method of forwarding.
b. Differentiate between Adaptive routing algorithm and Non-adaptive routing algorithm.
c. Draw structure of IPv4 header and explain various fields.
d. What are drawbacks of IP and how ICMP overcome it? Explain.

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e. Write a short note on OSPF and write features of OSPF.
f. What are advantages of Fragmentation? Explain two strategies of fragmentation.

5. Attempt *any three* of the following: **15**

a. Explain functions given to transport layer of ISO's OSI.
b. Explain following concepts with the context of TCP
   (a) Stream delivery
   (b) Sending and Receiving buffers.
c. Write a short note on UDP.
d. How DNS is beneficial for user? Explain.
e. What were the problems with message sending? And how MIME resolve them?
f. Explain the following:
   (a) WWW
   (b) FTP
