(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.
    Answer:
    Explaination2 marks, diagram 3 marks.
b. Discuss parallel transmission and serial transmission.
    Answer:
    Each carries 2 ½ marks
c. List and explain the function of each layer of ISO's OSI model with neat diagram.
    Answer:
    Each point carries 1 mark.
d. Explain the process of Amplitude Shift Keying with the data '**10110**'.
    Answer:

e. Differentiate between asynchronous transmission and asynchronous transmission.
    Answer:
    Each point carries 1 mark.

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.
    Answer:
    Diagram 2 marks. Explaination3 marks,
b. What are the problems in connecting multiple devices? How switching techniques overcome these problems?
    Answer:
    Problems 2 ½ marks, its solution 2 ½ marks
c. What are different duties assigned to data link layer of ISO's OSI model? Explain in brief.
    Answer:
    Each point carries 1 mark.
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.
    Answer:
    Each point carries 1 mark.

3. **Attempt _any three_ of the following:**   **15**

a. Write a short note on Framing and explain any 2 framing methods with example.
   Answer:
   Framing: 3 marks, methods 1 mark each.

b. Explain concept of sliding window with movement of both sender and receiver window.
   Answer:
   Explanation with diagram is expected

c. Explain S-frame and U-frame of HDLC with format.
   Answer:
   S-frame 2 ½ marks, U-frame 2 ½ marks

d. Draw and explain flow of ALOHA protocol and compare Pure ALOHA with Slotted ALOHA.
   Answer:
   Diagram and explanation 2 marks, comparison 3 marks.

e. Explain the architecture of Bluetooth with all its layer.
   Answer:
   Explanation with diagram is expected

f. Write a short note on
   (a) GPS
   (b) Geostationary Satellite.
   Answer:
   GPS 2 ½ marks, Geostationary Satellite 2 ½ marks

4. Attempt _any three_ of the following: **15**

a. What do you mean by forwarding? Explain Next hop method and Route method of forwarding.
   Answer:
   Forwarding 1mark, Next hop method 2, Route method 2 marks.

b. Differentiate between Adaptive routing algorithm and Non-adaptive routing algorithm.
   Answer:
   Each point carries 1 mark.

c. Draw structure of IPv4 header and explain various fields.
   Answer:
   Diagram 2 marks, explanation 3 marks.

d. What are drawbacks of IP and how ICMP overcome it? Explain.
   Answer:
   Drawbacks 2 ½ marks, Solution 2 ½ marks

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e. Write a short note on OSPF and write features of OSPF.
   Answer:
   OSPF **2 marks,** features of OSPF **3 marks**

f. What are advantages of Fragmentation? Explain two strategies of fragmentation.
   Answer:
   Advantages of Fragmentation **2 marks,** strategies of fragmentation **1 ½ each.**

5. **Attempt *any three* of the following:** 15
a. Compare and contrast between parallel and serial transmission.
    Answer:
    Each point carries 1 mark.

b. Explain following concepts with the context of TCP
        (a) Stream delivery
        (b) Sending and Receiving buffers.
    Answer:
    Stream delivery 2 ½ marks, Sending and Receiving buffers 2 ½ marks
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?
    Answer:
    Drawbacks 2 ½ marks, Solution 2 ½ marks

f. Explain the following:
        (a) WWW
        (b) FTP
    Answer:
    WWW 2 ½ marks, FTP2 ½ marks