Time: 2½ hrs.   Marks:75

Note:
1. All questions are compulsory with internal choice.
2. Draw neat diagrams wherever necessary.
3. Figures to the right indicate full marks.

Q.1   **Answer the following (any Three)**   (15)
(a) Explain components of data communication.
(b) Explain STAR topology and RING topology.
(c) Explain what is OSI reference model also explain Physical layer and Network layer.
(d) Explain Transmission impairments with it's causes.
(e) Explain Data flow with its type.
(f) Explain Data representation in detail.

Q.2   **Answer the following (any Three)**   (15)
(a) Explain Analog signal with its characteristics.
(b) If 7-bit hamming code received by a receiver is 1011011 assuming the even parity state whether the received code is correct or wrong. If wrong locate the bit in error.
(c) Generate the CRC code for the data word of 110010101 the divisor is 10101 , also verify at the receiver side.
(d) Explain what is flow control? Describe Stop and Wait protocol.
(e) Explain Go-back-N-ARQ and selective repeat request with diagram.
(f) Explain Hub and Router with diagram.

Q.3   **Answer the following (any Three)**   (15)
(a) Differentiate between IPv4 and IPv6.
(b) Find the error if any in the following IPv4 addresses.
    a) 151.56.045.78   b) 221.34.7.8.20   c) 75.45.505.14   d) 1101010010.23.14.67
    e) 10.25.32
(c) Explain pure ALOHA and slotted ALOHA.
(d) Find the class of following dotted decimal IPv4 addresses.
    a) 192.168.1.0   b) 10.10.200.6   c) 172.15.165.1   d) 230.10.65.30
    e) 10.10.10.8
(e) Draw IPv4 header format.
(f) Find the checksum of the following message
    10110001 10101011 00110101 10100001 also check at the receiver side.

Q.4   **Answer the following (any Three)**   (15)
(a) Draw header format of TCP and give it's features.
(b) Draw flow diagram of 3 way handshaking method of TCP.
(c) Write a note on Wi-Fi (802.11).
(d) Write a note on Bluetooth.
(e) Compare Bluetooth and Wi-Fi.
(f) Draw header format of UDP and write it's features.

Q.5   **Answer the following (any Three)**   (15)
(a) Explain HTTP protocol.
(b) Explain ICMP protocol.
(c) Compare UDP & TCP.
(d) Explain File Transfer Protocol.
(e) Explain SMTP and POP protocol.
(f) Explain with header format ARP protocol.

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