

(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.

Q. 1 Attempt the following**(a) Select the correct alternative****(5)**

- (i) The process-to-process delivery of the entire message is the responsibility of the _____ layer.
 A) Transport B) Application C) Physical D) Network
- (ii) _____ is the division of a datagram into smaller units to accommodate the MTU of a data link protocol.
 A) Breakup B) Fragmentation C) Decomposition D) Fusion
- (iii) _____ signals can have only a limited number of values.
 A) Digital B) Analog C) both A & B D) None of these
- (iv) _____ is a dynamic mapping method that finds a physical address, given a logical address.
 A) ARP B) RARP C) TCP D) UDP
- (v) In _____ transmission, bits are transmitted simultaneously, each across its own wire.
 A) Asynchronous serial B) Synchronous serial
 C) Parallel D) (a) and (b)

(b) Fill in the blanks with help of the options given in the pool below: (phase, coaxial, metric, TCP, Multiplexing, twisted pair, UDP, wavelength)**(5)**

- (i) _____ is the set of techniques that allows the simultaneous transmission of multiple signals across a single data link.
- (ii) _____ describes the position of the waveform relative to time 0.
- (iii) _____ cable consists of two insulated copper wires twisted together.
- (iv) A _____ is the cost assigned for passage of a packet through a network.
- (v) _____ provides process-to-process, full-duplex, and connection-oriented service.

(c) Answer the following in one or two lines:**(5)**

- (i) Define Latency.
- (ii) What is Throughput?
- (iii) Express the IP address 01110101 10010101 00011101 00000010 in dotted decimal notation.
- (iv) State the different types of noise.
- (v) Define Propagation Time.

Q. 2 Attempt the following (Any THREE) (15)

- (a) Write a short note on Mesh Topology.
- (b) Calculate following:
 - i) What is the bandwidth of signal that ranges from 40KHz to 4MHz?
 - ii) Periodic signal completes one cycle in 0.001s. What is the frequency
- (c) Briefly explain the layered structure of OSI model.
- (d) Explain following terms with respect to Data communication: Half duplex, full duplex, Protocol, Topology
- (e) State and explain different types of transmission impairments.
- (f) What are LAN, MAN, WAN? Explain.

Q. 3 Attempt the following (Any THREE) (15)

- (a) Explain with example the major steps involved in block coding.
- (b) What is shift keying? Explain ASK.
- (c) Discuss in brief wireless transmission with Radio waves.
- (d) Write a short note on CRC.
- (e) With the help of a diagram explain a Coaxial Cable.
- (f) Explain Wavelength Division Multiplexing.

Q. 4 Attempt the following (Any THREE) (15)

- (a) Explain concept of classes in classful addressing
- (b) Explain CSMA/CD technique in detail
- (c) State & briefly write about the phases in TCP connection.
- (d) Explain:
 - i. Unicast Address
 - ii. Multicast Address
 - iii. Anycast Address
- (e) What is polling? Explain in detail.
- (f) Write a short note on Distance-Vector Routing

Q. 5 Attempt the following (Any THREE) (15)

- (a) With the help of a diagram explain the components of data communication.
- (b) State and explain duties of Data Link layer.
- (c) Discuss RZ Scheme and encode the data sequence 1010101100.
- (d) Explain the format of user datagram.
- (e) Explain the role of the following network devices:
 - i) Hubs
 - ii) Switches
 - iii) Routers
