

- 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 All(Each of 5Marks)****(15M)****(a) Choose the best choice for the following questions:****(5 M)**

- (i) In simplex mode, the communication is \_\_\_\_\_  
 a) unidirectional      b) bidirectional      c) half way      d) None
- (ii) Which statement is false:  
 a) A network can be Hybrid      b) A mesh topology is robust  
 c) Star topology requires less cabling.      d) Star topology is used in High-speed LANs.
- (iii) The \_\_\_\_\_ Layer is responsible for the source - to -destination delivery of a packet across multiple network links.  
 a) data link      b) transport      c) network      d) session
- (iv) Attenuation, distortion, and noise can not impair a signal  
 a) TRUE      b) FALSE
- (v) The most common technique to change an analog signal to digital data is called\_\_\_\_  
 a) PCM      b) QAM      c) NRZ      d) Block Coding

**(b) Fill in the blanks. Use following pool to answer question.****(5 M)**

**Pool**(digital signal, analog signal, FTP, ICMP, Physical Layer, Data Link Layer, Five-Layer,Seven-Layer,4,8)

- (i) Line coding is the process of converting digital data to a \_\_\_\_\_
- (ii) \_\_\_\_\_protocol does not work on Network Layer
- (iii) Flow, Error and access control are the responsibilities of \_\_\_\_\_ layer.
- (iv) TCP/IP is a \_\_\_\_\_ hierarchical protocol suite developed before the OSI model.
- (v) An IP address consists of \_\_\_\_\_ octets separated by dots.

**(c) Answer the following questions:****(5 M)**

- (i) List key elements of Protocol.
- (ii) Consider a noiseless channel with a bandwidth of 3000Hz transmitting a signal with two signal levels, What will be the bit rate?
- (iii) What are different fundamental characteristic of Data Communications?
- (iv) What are different ways in which Analog to Analog conversion can be accomplished?
- (v) Which are the specific services provided by the application layer?

**Q. 2 Attempt the following (Any THREE)(Each of 5Marks) (15M)**

- What are the differences between half duplex and full duplex transmission mode?
- Name the four basic network topologies, and cite the advantage of each type.
- List and explain the five component of Data Communications system.
- What are different responsibilities of transport layer?
- Write a short note on Addressing.
- The period of a signal is 100 ms. what is its frequency in kilohertz?

**Q. 3 Attempt the following (Any THREE) (Each of 5Marks) (15M)**

- What are the differences between parallel and serial transmission?
- Which multiplexing technique is used for fiber optic link? Explain the reason.
- Name the advantages of optical fiber over twisted-pair and coaxial cable.
- Describe the need for switching and define a switch.
- How does a single bit error differ from a burst error?
- Discuss the concept of redundancy in error detection and correction.

**Q. 4 Attempt the following (Any THREE) (Each of 5Marks) (15)**

- Write a short note on Process to Process delivery.
- Discuss the disadvantages of Classful addressing.
- Explain the working of CDMA.
- What are the differences between random and controlled access?
- Explain the terms: i) HUB ii) Routers.
- Write a short note on Services of TCP.

**Q. 5 Attempt the following (Any THREE) (Each of 5Marks) (15)**

- Name and explain any three types of transmission impairments.
  - Compare and contrast a circuit switched network and Packet switched network.
  - Write a short note on "Connectionless versus Connection-Oriented Service".
  - If a periodic signal is decomposed into five sine waves with frequencies 100, 300, 500, 700 and 900 Hz, what is its bandwidth? Draw the spectrum, assuming all components have maximum amplitude of 10 V.
  - Write a short note on Pulse Code Modulation (PCM).
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