Code: DE21/DC11   Subject: **DATA COMMUNICATION & NETWORKS**

Time: **3 Hours**   Max. Marks: **100** | **DECEMBER 2007** |

NOTE: There are 9 Questions in all.
- **Question 1 is compulsory and carries 20 marks. Answer to Q. 1. must be written in the space provided for it in the answer book supplied and nowhere else.**
- **Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.**
- **Any required data not explicitly given, may be suitably assumed and stated.**

Q.1   **Choose the correct or the best alternative in the following:**   **(2x10)**

a.   Which of the following performs modulation and demodulation?

   (A) Fiber optic   **(B)** Satellite
   (C) Coaxial cable   **(D)** Modem

b.   The process of converting analog signals into digital signals so that they can be processed by a receiving computer is referred to as:

   (A) Modulation   **(B)** Demodulation
   (C) Synchronizing   **(D)** Asynchronizing

c.   A required characteristic of an on-line real-time system is:

   (A) More than one CPU   **(B)** Offline batch processing
   (C) No delay in processing   **(D)** All the above

d.   The systematic access of small computers in a distributed data processing system is referred to as:

   (A) Dialed service   **(B)** Multiplexing
   (C) Polling   **(D)** Conversational mode

e.   A teleprocessing system may consist of

   (A) User systems   **(B)** Communications Systems
   (C) Computer center systems **(D)** All of the above

f.   Computer network often work on the principle of

   (A) Remote switching   **(B)** Hybrid switching
   (C) Packet switching   **(D)** Message switching

g.   In a _____ topology, if there n devices in a network, each device has (n–1) ports to Band is always equivalent to

   (A) Mesh   **(B)** Star
   (C) Bus   **(D)** Ring

h.   Communication circuits that transmit data in both directions but not at the same time are operating in:

   (A) A Simplex mode   **(B)** A Half-duplex mode
   (C) A full-duplex mode   **(D)** Asynchronous mode

i.   An example of the medium-speed, switched communications services is:

   (A) Series 1000   **(B)** Data phone 50
   (C) DDD   **(D)** All of the above

j.   A Communications device that combines transmission form several I/O devices into online is a:

   (A) Concentrator   **(B)** Modifier

(C) Multiplexer   (D) Full-duplex line

Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.

Q.2   a.   What is Packet switching? Write the advantages and disadvantages of packet switch network.   **(8)**

      b.   What are the different activities of Data link layer?   **(8)**

Q.3   a.   State the principles that are applied to arrive at seven layers in OSI reference model.   **(6)**

      b.   Television channel is 6 M Hz wide. How many bits per second can be sent if four level digital signals are used? **(4)**

      c.   Discuss the various factors, affecting the performance of Network at the router level.   **(6)**

Q.4   a.   Write a short notes on ISDN and explain the advantages of it.   **(6)**

      b.   How does Errors Happen? Give the name of the concerned network layer in which error control exists and explain the basic services of that layer. **(6)**

      c.   A binary signal is sent over a 3000 Hz channel whose (S/N) = 10 dB. What is the maximum achievable data rate? **(4)**

Q.5   a.   Illustrate different network topologies. Explain one topology in detail, which is widely used in computer networking and comment as to why it is widely used.   **(6)**

      b.   State the design issues for the layers in Network Architecture.   **(6)**

      c.   What is encoding and why it is needed in digital transmission?   **(4)**

Q.6   a.   What is the function of routing algorithm? Explain Link -Static routing.   **(7)**

      b.   What are the functions of the ATM adaptation layer? List the various ATM services.   **(5)**

      c.   What are X.25 protocol layer? How does each relate to the OSI layers? Name the frame types of X.25 and cite their primary functions.   **(4)**

Q.7   a.   What do you mean by TCP/IP? Explain TCP segment format with a detailed diagram.   **(10)**

      b.   Write short notes on Error Correction. **(6)**

Q.8   a.   Give a brief description of the application and discuss the advantages of the following types of transmission media:
      (i)   Twisted pair lines.
      (ii)   Microwaves.   **(10)**

      b.   Briefly explain the following with reference to application layer:
      (i)   WWW
      (ii)   HTTP
      (iii) SNMP   **(6)**

Q.9   a.   Discuss the three main switching methods. How is space division switching superior to time division switching.   **(8)**

      b.   Explain briefly the design issues of an application layer including FTAM, E-mail and virtual terminals.   **(8)**