T.E. (IT) (2003 Course) (Semester – I) Examination, 2009
DATA COMMUNICATION AND NETWORKING

Time : 3 Hours Max. Marks : 100

Instructions *: 1) Answer **3** questions from Section **I** and **3** questions from Section **II**.*
*2) **Neat** diagrams must be drawn **wherever** necessary.*
*3) Assume suitable data, if **necessary**.*

SECTION – I

1. A) Explain the following modulation techniques.
   1) ASK 2) FSK 3) PSK 4) QAM. **8**

   B) Calculate maximum bit rate of channel having bandwidth of 1.5 KHzs if
   1) S/N ratio is 0 dB
   2) S/N ratio is 20 dB. **6**

   C) Explain the difference between data and information. **4**

   OR

2. A) What is hamming code ? Discuss the hamming code technique if data to be sent is 1001101. **8**

   B) State and explain Shannon's channel capacity theorem. **6**

   C) What is forward error correction ? Give an example of 1 bit error correcting code. **4**

3. A) Describe T1 frame structure. Also discuss the capacities of E1, E2, E3 and E4 lines. **8**

   B) Explain SONET technology with respect to
   1) SONET frames
   2) SONET devices
   3) Synchronous transport signal. **8**

   OR

4. A) Explain DMT used in ADSL. Discuss on VDSL, HDSL. 8

   B) Write short notes on :
      1) Circuit switching
      2) Packet switching. 8

5. A) Derive an expression for the 'angle of acceptance' and 'numerical aperture' in fiber optic communication. 8

   B) Explain various multiple access methods used in satellite communication. 8

OR

6. A) Explain the operation of cellular telephony. 8

   B) Explain the three Kepler's laws. 8

SECTION – II

7. A) Explain briefly electrical, mechanical and functional specifications of EIA -232. 8

   B) Explain the functions of repeater, switch and rooter. 6

   C) Explain the concept of null-modem. 4

OR

8. A) Explain OSI reference model in detail. 8

   B) Explain Star and Mesh topologies in brief along with its merits and demerits. 6

   C) Explain PCI in brief. 4

9. A) Explain the need of Random Access technique. Explain in brief ALOHA, slotted ALOHA and CSMA/CD mentioning the efficiency of each. 8

   B) Explain ARQ. Also explain stop and wait ARQ, Go-back-n ARQ, selective repeat ARQ. 8

OR

10. A) Explain point-to-point protocol stack in brief. 8

    B) Discuss CSMA/CA random access technique. How collision avoidance is achieved in this technique ? 8

11. A) What is VLAN ? State the advantages of VLAN. Explain how to setup VLAN using Layer-2 switches. **8**

B) Discuss the token passing access method used in FDDI with appropriate example. Also define :

1) Target Token Rotation Time (TTRT)

2) Token Rotation Timer (TRT)

3) Token Holding Timer (THT). **8**

OR

12. A) Explain 100 Base Tx fast ethernet specification. **6**

B) Write short notes on :

1) DQDB

2) Gigabit Ethernet. **10**
