ALCCS

Code: CS32   Subject: COMPUTER NETWORKS
Time: 3 Hours   Max. Marks: 100

NOTE:
- **Question 1 is compulsory and carries 28 marks. Answer any FOUR questions from the rest. Marks are indicated against each question.**
- **Parts of a question should be answered at the same place.**

Q.1   a. Differentiate between Voice Network and Data Network.

   b. Compute the bit rate for a 12000 basic baud using 32-QAM signal.

   c. How many transmission impairments are there affecting the channel?

   d. Differentiate between the Stop and wait protocol and sliding window protocol.

   e. Describe about Nyquist theorem.

   f.   Suppose an old SYN segment from station A arrives at station B, requesting for TCP connection. Explain how the three-way handshake procedure ensures that the connection is rejected.

   g. Using RSA public key cryptosystem with a =1, b=2, etc., if p=13 and q=31 and d=7 find e. **(7 × 4)**

Q.2   a. If the bit string 0111101111101111110 is bit stuffed, compute the output string   for   this   and   explain   the logic.

   b. Using Differential Manchester encoding scheme, encode the bit sequence 0101101001.

c. If binary signal is sent over a 3-kHz channel whose signal-to-noise ratio is 20 dB. What is the maximum achievable data rate? **(6+6+6)**

Q.3 a. A 100 km long cable runs at T1 data rate. The propagation speed in the cable is 2/3 the speed of light. How many bits fit in the cable?

b. A channel has a bit rate of 4 kbs and a propagation delay of 20 milliseconds. For what range of frame size does stop-and-wait give an efficiency of at least 50 percent?

c. Compute the CRC for a 8-bit sequence 10100001 and a divisor of $x^3 + 1$
. **(6+6+6)**

Q.4 a. Describe the design issues for the Network Layers Architecture. Also give the diagram for TCP/IP model with protocols and layers.

b. Why is slot reservation needed in DQDB? Describe the slot reservation method used in DQDB?

c. What is the principal difference between connectionless and connection oriented protocol? Explain with examples confirmed and unconfirmed kind of services. **(6+6+6)**

Q.5 a. Differentiate between Adaptive and non Adaptive routing algorithms.

b. Describe a way to do reassembly of IP fragments at the destination.

c. Give the format of IPv6 datagram and explain functions of each field. **(6+6+6)**

Q.6 a. Why does UDP exist? Would it not have been enough to just let user processes send raw IP packets? Justify answer.

b. Differentiate between the services offered by transport layer and network layer.

c. A TCP machine is sending windows of 65535 bytes over a 1-Gbps channel that has a 10-milisecond one–way delay. What is the maximum throughput achievable? What is the line efficiency? **(6+6+6)**

Q.7   a.   Write   the   DES   algorithm   for   data encryption.

b. Decipher the following monoalphabetic cipher. (*Note: the space as it is*)
            "VRGR   PBHEFR VF TBBQ"

c. Write a short note on one of the following
   (i) HTTP   (ii) Queuing Theory   (iii) CSMA/CD   **(6+6+6)**