

## Computer Networks

P. Pages : 2

Time : Three Hours



TKN/KS/16/7496

Max. Marks : 80

- Notes :
1. All questions carry marks as indicated.
  2. Solve Question 1 OR Questions NO. 2.
  3. Solve Question 3 OR Questions NO. 4.
  4. Solve Question 5 OR Questions NO. 6.
  5. Solve Question 7 OR Questions NO. 8.
  6. Solve Question 9 OR Questions NO. 10.
  7. Solve Question 11 OR Questions NO. 12.
  8. Due credit will be given to neatness.
  9. Assume suitable data whenever necessary.

1. a) Why do we need network? Explain advantages and disadvantages of layering in Computer Network. 7
- b) What is difference between a physical and logical topology ? Define different physical topologies that are used in the network. 7
- OR**
2. a) List two ways in which the OSI reference model and the TCP/IP reference model are same. Now list two ways in which they differ. 4
- b) Match the following to one or more layers of the OSI Model. 10
- i) Communications directly with user's application program.
  - ii) Error Correction and retransmission.
  - iii) Mechanical, electrical and functional interface.
  - iv) Log-in and Log-out procedures.
  - v) Route determination.
  - vi) Provides access for the end user.
  - vii) Interface to transmission media.
  - viii) Process to process delivery.
  - ix) Provides user services such as e-mail and file transfer.
  - x) Carrying frames between adjacent nodes.
3. a) The following character encoding is used. 9
- A:01000111      B:11100011  
FLAG:01111110    ESC:11100000
- Show the bit sequence transmitted (in binary) for the above four character frame: ABESC FLAG with each of the following framing methods.
- i) Character count
  - ii) Flag bytes with byte stuffing
  - iii) Starting and ending flag bytes, with bit stuffing
- b) Explain Go-Back-N ARQ Protocol. 4

**OR**

4. a) A bit stream 10011101 is transmitted using the standard CRC method. The generator polynomial is  $x^3 + 1$ . Show the actual bit string transmitted. Suppose the third bit from the left is inverted during transmission. Show that this error is detected at the receiver's end. **8**
- b) Explain selective repeat ARQ. **5**
5. a) What do you mean by PPP? What is the need of PPP Also explain the services provided by PPP? **4**
- b) A large population of ALOHA users manages to generate 50 requests/sec, including both originals and retransmissions. Time is slotted in units of 40m sec. **9**
- i) What is the chance of success on the first attempt ?
- ii) What is the probability of exactly K collisions and then a success ?
- iii) What is the expected number of transmission attempts needed ?
- OR**
6. a) Explain fast Ethernet and Gigabit Ethernet. Also explain the difference. **6**
- b) How CDMA allow each station to transmit over the entire frequency spectrum all the time? Explain with example. **7**
7. a) What routing technique is applied in flooding? How flooding affect network performance? **7**
- b) Explain distance vector routing. **6**
- OR**
8. a) Explain Static Vs dynamic routing. **7**
- b) Explain link state routing. **6**
9. a) Explain Token Bucket & Leaky Bucket Algorithm stating difference between them. **7**
- b) Compare and contrast IPv4 & IPv6. **6**
- OR**
10. a) List and explain ICMP<sub>v4</sub> messages along with its respective codes. **7**
- b) What is congestion ? How choke packet algorithm helps congestion control ? **6**
11. a) What do you mean by Quality of Services ? Discuss technique to improve QoS. **7**
- b) Why connection oriented and connection-less transport protocols are needed ? Explain TCP. **7**
- OR**
12. Write note on:
- i) ISDN **4**
- ii) IEEE 802.11. **4**
- iii) Bluetooth. **3**
- iv) Cellular telephony & satellite network. **3**

\*\*\*\*\*