

**B TECH**  
**(SEM-VI) THEORY EXAMINATION 2018-19**  
**COMPUTER NETWORKS**

Time: 3 Hours

Total Marks: 100

**Note: 1.** Attempt all Sections. If require any missing data; then choose suitably.**SECTION A****1. Attempt all questions in brief.****2 x 10 = 20**

- a. Consider a noiseless channel with a bandwidth of 3000 Hz transmitting a signal with four signal levels. What is the maximum bit rate?
- b. A bit string **000111111100111101000** needs to be transmitted at the data link layer. What is the string actually transmitted after bit stuffing?
- c. Write four differences between circuit switching and packet switching.
- d. Sketch Manchester and differential Manchester encoding for the following bit stream: 10111100010010011101
- e. Write two use of subnet mask.
- f. What do you mean by DNS?
- g. What are the services of Transport Layer?
- h. What are the major advantages of using optical fiber over twisted pair cable?
- i. Taking  $p=5$ ,  $q=11$ ,  $d=27$  in RSA. Find the value of  $e$ .
- j. Convert the IPv4 address whose hexadecimal representation is C22F15B2 to dotted decimal notation. What is the class of this address?

**SECTION B****2. Attempt any three of the following:****10 x 3 = 30**

- a. What do you mean by network architecture? What should be their design issues? Explain briefly.
- b. Explain the working of pure ALOHA and slotted ALOHA protocols. How slotted ALOHA improve the performance of pure ALOHA?
- c. What do you mean by adaptive and non-adaptive routing algorithm? Discuss Distance Vector Routing including count to infinity problem.
- d. Discuss TCP window management in detail. Also explain silly window syndrome and their solution.
- e. Discuss different types of transmission media with their advantages and disadvantages.

**SECTION C****3. Attempt any one part of the following:****10 x 1 = 10**

- (a) Differentiate OSI and TCP/IP reference model. Which one is more popular and why?
- (b) Suppose a signal travels through a transmission medium then find:
  - i) The attenuation (loss of power) if the power is reduced to one half.
  - ii) The amplification (gain of power) if the power is increased 10 times.

4. **Attempt any one part of the following:** **10 x 1 = 10**
- (a) List different carrier sense protocols. How CSMA/CD protocol is different from other CSMA/CA protocol?
- (b) What do you mean by transmission impairment? Explain different types of transmission impairment.
5. **Attempt any one part of the following:** **10 x 1 = 10**
- (a) What is Congestion? Differentiate between congestion control and flow control with example. Also discuss congestion prevention policies.
- (b) Sketch the IP header neatly and explain the functions of each field. What are the deficiencies of IPV4 over IPV6?
6. **Attempt any one part of the following:** **10 x 1 = 10**
- (a) An organization is granted a block 211.17.180.0 /24. The administrator wants to create 32 subnets
- i) Find the subnet mask.
  - ii) Find the number of addresses in each subnet.
  - iii) Find the first & last address in subnet 1.
  - iv) Find the first & last address in subnet 32.
- (b) The symbols & their frequencies are given below
- | Symbol    | A  | B  | C  | D  | E  | F  | G | H |
|-----------|----|----|----|----|----|----|---|---|
| Frequency | 20 | 18 | 16 | 15 | 15 | 10 | 4 | 2 |
- Construct Huffman codes.
7. **Attempt any one part of the following:** **10 x 1 = 10**
- (a) Encrypt “EXTRANETPLANETSOURCE” using a transposition cipher with the following key:
- 3 5 2 4**
- (b) Explain the following:
- (i) Telnet
  - (ii) FTP
  - (iii) SNMP
  - (iv) HTTP
  - (v) MIME