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B.E (Full Time) DEGREE END SEMESTER EXAMINATIONS, APRIL / MAY 2014

Electronics and Communication Engineering

Sixth Semester

EC 9353 – COMMUNICATION NETWORKS

(Regulation 2008)

Time : 3 Hours

Answer ALL Questions

Max. Marks 100

PART-A (10 x 2 = 20 Marks)

1. Specify the relative merits and demerits of Bus topology and Mesh Topology.
2. What is the result of scrambling the sequence 1110000000000 using HDB3 scrambling techniques? Assume the number of nonzero pulses is odd after the last substitution and the last non-zero signal level has been positive.
3. A channel has a data rate of 8 kbps and a propagation delay of 40 ms. For what range of frame sizes does stop-and-wait give an efficiency of at least 50%?
4. Map the interconnecting devices to the OSI architecture.
5. How is a IPv4 carrying out the flow control mechanism?
6. What is the significance of Virtual Private Network (VPN)?
7. Compare TCP and UDP protocol.
8. What is a proxy server and how is it related to HTTP?
9. Determine the implementation complexity of the TS switch, where the number of TDM input lines $N = 80$ and assume each input line contains a single DSI signal (24 channels). Furthermore assume a one-stage matrix is used for the space stage.
10. What are the demerits of TDM and how will you overcome it.

Part – B (5 x 16 = 80 Marks)

11. (i) How are OSI and ISO related to each other? Explain in details the architecture of TCP/IP protocol. (8)
(ii) Consider a digital communication system that relates the Nyquist and Shannon formulations. The spectrum of the channel is between 3 MHz and 4 MHz and $SNR_{dB} = 24$ dB. Determine the maximum channel capacity of the system and find the number of discrete signals or voltage levels. (4)
(iii) Discuss the transmission characteristics of Microwave Communication. (4)
12. (a) (i) In a CRC error-detecting scheme, choose $P(x) = x^4 + x + 1$. Encode the bits 10010011011. (4)
(ii) Suppose the channel introduces an error pattern 100010000000000 (i.e., a flip from 1 to 0 or from 0 to 1 in position 1 and 5). What is received? Can the error be detected? (4)

(b) With neat sequence diagram, explain Go-back-N ARQ protocol. (8)

(or)

12. (b) (i) Assume we have four stations 1, 2, 3, and 4 connected to the same channel. The data from station 1 are $d1$, from station 2 are $d2$, and so on. The code assigned to each station are $c1 = [+1 +1 +1 +1]$, $c2 = [+1 -1 +1 -1]$, $c3 = [+1 +1 -1 -1]$ and $c4 = [+1 -1 -1 +1]$.

Assume that the assigned codes have two properties.

1. If we multiply each code by another, we get 0.

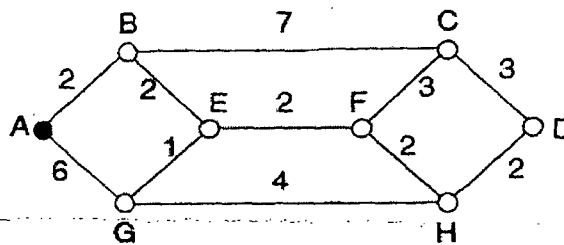
2. If we multiply each code by itself, we get 4.

(a) Explain how these four stations send data using same common channel. (4)

(b) Explain how station 3 can detect the data sent by station 2. (4)

(b) (ii) With relevant diagram, explain the idea behind CSMA/CA in detail. (8)

13. (a) (i) Find the shortest path between node A and node D for the following network using Link State Routing Protocol (10)



(ii) Compare ARP and RARP. Discuss on the steps involved in ARP process. (6)

(or)

13. (b) (i) Explain congestion control concept with a suitable example and discuss on various categories of congestion control. (8)

(ii) Briefly discuss on the types of messages carried by the Internet Control Message Protocol (ICMP). (8)

14. (a) (i) Write notes on TELNET and explain how the control and data characters are distinguished in NVT? (8)

(ii) Explain the services offered by TCP to process at the application layer. (8)

(or)

14. (b) (i) Discuss various functions of Network Management System in detail. (8)

(ii) With relevant diagram, explain the Data Encryption Standard algorithm. (8)

15. (a) (i) Describe the STS and TST switching techniques and compare the implementation complexity of both the techniques. (10)

(ii) How many cross point are needed in a 1024line, three-stage space wire if the input loading is six common-channel signal per line and the maximum acceptable blocking probability (using a Lee graph analysis) is 0.005?

(a) If $n=16$, $N/n = 64$

(b) If $n=32$, $N/n=32$

(c) If $n= 64$, $N/n = 1$

(6)

(or)

15. (b) Explain in detail the Digital Cross Connect System with relevant diagram. (16)