ADAMAS UNIVERSITY
SCHOOL OF ENGINEERING AND TECHNOLOGY

END-SEMESTER EXAMINATION: DECEMBER 2019

(Academic Session: 2020 – 21, Semester Term: Aug 2020– Jan 2021)

Name of the Program: B.Tech. Semester: VII
Stream: ECE
PAPER TITLE: Data Communication & Networking PAPER CODE: EEC44105
Maximum Marks: 40 Time duration: 3 hours
Total No. of questions: 09 Total No of Pages: 02

Note:

1. Please follow all the Instructions given on the cover page of the Answer Booklet Strictly.
2. All parts of a Question should be answered consecutively. Each Answer should start from a fresh page.
3. Assumptions made if any, should be stated clearly at the beginning of your answer.
4. No Mobile Phones will be permitted in the Examination Hall.

Answer all the Groups

Group A

(Answer all the questions)

$5 \times 1 = 5$

1. **a)** Express channel utilization as a function of throughput S, and offered load G for pure ALOHA protocol.
   b) What is the total number of physical channels required to link n devices in a fully connected Mesh network?
   c) Find the maximum bit rate of a channel having bandwidth 3100 Hz and S/N ratio of 20 dB.
   d) What is the maximum throughput (in terms of percentage) that can be obtained using Pure ALOHA (at 50% of offered load) and Slotted ALOHA (at 100% offered load) protocols respectively?
   e) What is the total number of keys required for n users in private key cryptography? Also, calculate the total number of keys required in public key cryptography?

Group B

(Answer any three questions)

$3 \times 5 = 15$

2. What is flooding? Why flooding technique is not commonly used for routing? Explain with the aid of suitable diagram. [1+1+3]

3. Compare and explain the OSI reference model with the TCP/IP reference model. Mention the function of each layer. [4+1]

4. Explain and compare VCI to datagram switching with the help of suitable diagram and comment on the total delay for these switching techniques. [4+1]

5. Mesh topology and Star topology with the help of suitable illustrative diagrams. Why is twisting done in twisted pair cable? [3+2]

6. What is an IP address? Discuss the class field in IP address.

What is the major limitation of CSMA/CD protocol? [1+3+1]

Group C

(Answer any two questions)

$\mathbf{2 \times 10 = 20}$

7. a) Consider the use of 10 K-bit size frames on a 10 Mbps satellite channel with 270 ms delay. What is the link utilization for stop-and-wait ARQ technique assuming $P = 10^{-3}$?

b) Explain Leaky Bucket algorithm and its limitation. [5+3+2]

8. a) Describe Stop and wait ARQ and Go-Back-N ARQ with the aid of suitable diagram.

b) Explain the Sliding window protocol with the help of schematic diagram. [5+5]

9. a) Draw and explain a simple cryptography model. Draw and explain Symmetric key cryptography and Public key cryptography.

b) Explain about the binary exponential back off in CSMA/CD protocol with the aid of suitable flow chart. [2+3+5]

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