5E5103

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5E5103

B. Tech. V Sem. (Main/Back) Exam., Nov.-Dec.-2016

Computer Engineering

5CS3A Telecommunication Fundamentals

Time: 3 Hours

Maximum Marks: 80
Min. Passing Marks Main: 26
Min. Passing Marks Back: 24

Instructions to Candidates:

*Attempt any **five questions,** selecting **one question** from **each unit.** All questions carry **equal** marks. Schematic diagrams must be shown wherever necessary. Any data you feel missing suitably be assumed and stated clearly.*

Units of quantities used/calculated must be stated clearly.

Use of following supporting material is permitted during examination. (Mentioned in form No. 205)

1. NIL

2. NIL

UNIT – I

Q.1 (a) Draw the following reference models used in computer communication - [8]

(i) OSI / ISO Model

(ii) TCP/ IP Model

(b) Explain the stop and wait ARQ Protocol and also discuss the Piggy backing method. [8]

OR

Q.1 (a) In a Microwave communication link, two identical antennas operating at 10 GHz are used with power gain of 40db. If the transmitter power is 1 W, find the received power if the range of the link is 30km. [8]

(b) What do you understand by synchronization problem? How to solve it? Explain with suitable example. [8]

UNIT – II

Q.2 (a) Show that slotted ALOHA has a maximum throughput of twice the pure ALOHA maximum throughput. [8]

(b) Explain the frame structure of point to point protocol. What is difference between HDLC and PPP? [8]

OR

Q.2 (a) A 1 km, 10MbPS CSMA/CD LAN has a propagation speed of 200m/ μ sec. Data frames are 256 bits long, including 32 bits of header. Check sum and other overhead for the receiver to capture the channel to send a 32 bit acknowledgement frame. What is effective data rate excluding overhead, assuming there are no collisions? [8]

(b) Explain the frame structure of point to point protocol. What is difference between HDLC and PPP? [8]

UNIT – III

Q.3 (a) What is looping problem in switching? Explain spanning. Explain spanning Tree protocol in detail. [10]

(b) What is the difference between a forwarding port and a blocking port? [6]

OR

Q.3 (a) What is Hidden Node and Exposed Node problem? Explain with example. [8]

(b) What is the function of L2CAP layer in Bluetooth? [4]

(c) Explain Piconet and Scatternet in Bluetooth. [4]

UNIT – IV

Q.4 (a) Assume that the velocity of propagation on a TDM bus is 0.8 c (c =Speed of light), its length is 10M, and the data rate is 500 MbPS. How many bits should be transmitted in a time slot to achieve a bus utilization of 99%? [8]

(b) Explain TDMA superframe structure. Are collisions possible in TDMA and FDMA? Justify. [8]

OR

Q.4 (a) Describe ADSL. Also discuss the two systems used in ADSL. [8]

(b) Consider a PCM system in which 24 signals are to be time division multiplexed. Each signal has a 3 kHz bandwidth. The sampling rate is 33.3 percent higher than the theoretical maximum and 8 bits are used for each sample.

(i) Determine the required bit rate. [4]

(ii) Find the minimum required transmission bandwidth. [4]

UNIT – V

Q.5 (a) What are the various spread spectrum techniques? Explain frequency hopped spread spectrum technique. [8]

(b) Explain CDMA. What is forward and reverse CDMA channel? [8]

OR

Q.5 (a) Define following (Any two): [4×2=8]

(i) M- sequence

(ii) Hand off

(iii) IMT - 2000

(b) What is Walsh Code Synchronization? Explain. [8]
