5E5103

Roll No. _____ Total No of Pages: 3

5E5103

B. Tech V Sem. (Main/Back) Exam. Nov-Dec. 2015
Computer Science & Engineering
5CS3A Telecommunication Fundamentals
Common with IT

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.

1. NIL 2. NIL

UNIT-I

Q.1 (a) Explain the layered architecture of OSI Model. What is the significance of OSI model? What is the significance of XDR (External Data Representation) at presentation layer? [10]

(b) Calculate the channel capacity of a telephone line having bandwidth 3000Hz in following cases -

(i) SNR=3162 [3]

(ii) Noise is so strong that the signal is faint means SNR is almost zero. [3]

OR

Q.1 (a) The loss in a cable is usually defined in decibels per kilometer. If the signal at the beginning of a cable with -0.3db/km has a power of 2mW, what is the power of the signal at 5km? [4]

(b) A digital signal has eight levels. How many bits are needed per level? [2]

(c) Explain NRZ-L, NRZ-I and RZ line encoding. [6]

(d) Assume that, in a stop and wait ARQ system, the bandwidth of the line is 1Mbps, and 1 bit takes 20ms to make a round trip. What is the bandwidth delay product? If the system data frames are 1000 bits in length, what is the utilization percentage of the link? [4]

UNIT-II

Q.2 (a) (i) Find the Hamming distance between two binary pattern 10101 and 11110. [2]

(ii) Can the value of a checksum be all 0s (in binary)? Defend your answer. Can the value be all 1s (in binary)? Defend your answer. [4]

(iii) How is the simple parity check related to the two-dimensional parity check? [4]

(b) Explain the frame structure of point to point protocol. What is difference between HDLC and PPP? [6]

OR

Q.2 (a) A pure ALOHA network transmits 200 bit frames on a shared channel of 200 kbps. What is the throughput if the system (all station together) produces 1000 frame per second? [8]

(b) What is vulnerable time in case of pure and slotted ALOHA? How we can determine the underload and overload situation for channel in pure and slotted ALOHA. [8]

UNIT-III

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

(b) Explain piconet and scatternet in Bluetooth. [8]

OR

Q.3 (a) What is looping problem is switching? Explain spanning Tree protocol in detail. [8]

(b) Explain Virtual LANs. How we can configure VLAN in switch? [8]

UNIT-IV

Q.4 (a) Explain TDMA superframe structure? Are collisions possible in TDMA and FDMA? Justify. [8]

(b) We need a three-stage space division switch with N=120. We use 10 crossbars at the first and third stages and 4 crossbars at the middle stages. Calculate the total no. of cross points. [8]

OR

Q.4 (a) What is the goal of Multiplexing? Four channels, two with a bit rate of 300 kbps and two with a bit rate of 250 kbps, are to be multiplexed using multiple slot TDM with no synchronization bit. What is the size of a frame in bits and what is the data rate? [8]

(b) Explain ADSL, DS 1 and DS 3 carriers. [8]

UNIT-V

Q.5 (a) What is difference between multiplexing and spread spectrum? Explain FHSS. [8]

(b) An FHSS system uses a 5-bit PN sequence. If the bit rate of the PN is 64 bits per second, answer the following -

(i) What is the total number of possible hops? [4]

(ii) What is the time needed to finish a complete cycle of PN? [4]

OR

Q.5 (a) Explain CDMA with help of example. [8]

(b) Write short note on following -

(i) Walsh codes [4]

(ii) Hand off [4]
