

Code: DE69/DC63 Subject: DATA COMMUNICATION & NETWORKS

DiplETE – ET/CS

Time: 3 Hours

JUNE 2013

Max. Marks: 100

PLEASE WRITE YOUR ROLL NO. AT THE SPACE PROVIDED ON EACH PAGE IMMEDIATELY AFTER RECEIVING THE QUESTION PAPER.

NOTE: There are 9 Questions in all.

- Question 1 is compulsory and carries 20 marks. Answer to Q.1 must be written in the space provided for it in the answer book supplied and nowhere else.
- The answer sheet for the Q.1 will be collected by the invigilator after 45 minutes of the commencement of the examination.
- Out of the remaining EIGHT Questions answer any FIVE Questions. Each question carries 16 marks.
- Any required data not explicitly given, may be suitably assumed and stated.

Q.1 Choose the correct or the best alternative in the following: (2×10)

- a. Start and Stop bits are used in serial communication for _____
- (A) Error detection (B) Synchronisation
(C) Error correction (D) None of these
- b. Which of the following is not a field on the Ethernet message packet?
- (A) Type (B) Pin
(C) Data (D) Address
- c. The X.25 standard specifies a
- (A) Technique for dual access
(B) Technique for start and stop data
(C) Interface between host system and packet switching network
(D) Data bit rate
- d. Which of the following TCP/IP protocol is used for transferring electronic mail messages from one machine to another?
- (A) FTP (B) SNMP
(C) SMTP (D) RPC
- e. In ISO- OSI network architecture, the routing is performed at
- (A) Transport layer (B) Data link layer
(C) Network layer (D) Session layer

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- f. Usually, it takes 10-bits to represent one character. How many characters can be transmitted at a speed of 1200 BPS?
- (A) 10 (B) 12
(C) 120 (D) 1200
- g. In CRC there is no error if the remainder at the receiver is _____
- (A) Equal to the remainder at the sender
(B) Zero
(C) Nonzero
(D) The quotient at the sender
- h. You have a class A network address 10.0.0.0 with 40 subnets, but are required to add 60 new subnets very soon. You would like to still allow for the largest possible number of host IDs per subnet. Which subnet mask should you assign?
- (A) 255.240.0.0 (B) 255.248.0.0
(C) 255.254.0.0 (D) 255.255.255.255
- i. Data flow between two devices can occur in a _____ way.
- (A) Simplex (B) Half-duplex
(C) Full-duplex (D) All of these
- j. What does the "S" in HTTPS stand for?
- (A) Slow (B) Secured
(C) Socket (D) System

**Answer any FIVE Questions out of EIGHT Questions.
Each question carries 16 marks.**

- Q.2** a. Briefly describe the following terms for the nature of standardization required at each layer – Protocol specification, Service definition and Addressing. (6)
- b. Differentiate between circuit switching and packet switching. (4)
- c. Briefly state any two applications that have been standardized to operate on the top of TCP. (6)
- Q.3** a. What do you understand by Bandwidth of a channel? State the characteristics of a channel. (6)
- b. Differentiate between guided and unguided media. (6)

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- c. Calculate the channel capacity of a communication channel with $W=3.4 \times 10^4$ Hz and Signal to Noise Ratio = 10^4 . (4)
- Q.4** a. Explain parity check and Cyclic Redundancy check method of error detection. (8)
- b. How audio stream and Video stream digital data transmitted over the communication network? (8)
- Q.5** a. What is multiplexing? Why it is used? Briefly mention three types of multiplexing techniques. (8)
- b. Describe Stop-and-wait ARQ used for error control. Show how this algorithm perform in the case of lost frame. (8)
- Q.6** a. What do you mean by routing in packet-switching network? Why is it sometimes called an optimization problem? Explain any *two* basic routing algorithms. (8)
- b. What are the various methods to avoid congestion in networks? (8)
- Q.7** a. What are the basic topologies used in LAN? Describe LAN protocol architecture. (10)
- b. Write a short note on CSMA/CD. Describe CSMA/CD frame structure. (6)
- Q.8** a. Explain connection-oriented and connectionless internet-working. (8)
- b. What is meant by dotted decimal notation used in network addressing? (4)
- c. What are the enhancements of IPv6 over IPv4? (4)
- Q.9** a. Explain briefly any *four* common routing protocols used in Internetworking. (8)
- b. In the early days of the ARPANET, e-mail consisted exclusively of text messages written in English and expressed in ASCII. But now a day you can send audio, images etc. through E-mail. How is this made possible? (8)