Code: DE69/DC63   Subject: DATA COMMUNICATION & NETWORKS

DipIETE – 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

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)**

c. Calculate the channel capacity of a communication channel with $W=3.4 \times 10^3$ 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)**