ROLL NO. _____

Code: DE69 / DC63 Subject: DATA COMMUNICATION & NETWORKS

DipIETE – ET/CS (Current Scheme)

Time: 3 Hours **JUNE 2015** **Max. Marks: 100**

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. The _____ layer changes bits into electromagnetic signals.

(A) Physical **(B)** Data link
(C) Transport **(D)** Application

b. As the data packets move from the lower to the upper layers, headers are_____.

(A) Added **(B)** Removed
(C) Rearranged **(D)** Modified

c. If a symbol is composed of 3 bits, there are _____ data levels.

(A) 2 **(B)** 4
(C) 8 **(D)** 16

d. OSI reference model has _____ layers.

(A) 5 **(B)** 3
(C) 7 **(D)** 10

e. A signal has a range of frequency from 300Hz to 3400Hz. What is its bandwidth?

(A) 300Hz **(B)** 3400Hz
(C) 3100Hz **(D)** 3700Hz

f. Transmission media are located below _____ layer.

(A) Data link **(B)** Physical
(C) Network **(D)** Transport

g. Ethernet uses _____ protocol.

(A) CSMA **(B)** ALOHA
(C) CSMA/CD **(D)** CSMA/CA

h. Wireless LAN uses _____ standard.

(A) 802.1 **(B)** 802.3
(C) 802.15 **(D)** 802.11

i. IP address in IPv4 has _____ bits.

(A) 8 **(B)** 16
(C) 32 **(D)** 128

j. One-to-all communication is called _____ communication.

(A) Unicast **(B)** Multicast
(C) Broadcast **(D)** Anycast

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

Q.2 a. Describe OSI reference model of a computer network with a diagram. Discuss the function of each layer. **(6)**

b. Draw the block schematic of a communications model and explain the function of each block. **(6)**

c. Draw the sequence diagrams of a confirmed service and a non- confirmed service. **(4)**

Q.3 a. A telephone line carrier frequencies between 300 and 3400Hz. The signal to noise ratio for the telephone line is 35dB. Calculate the theoretical bit rate of the line. **(6)**

b. Explain the two modes of operation with fiber optic cables with suitable illustrations. **(6)**

c. Illustrate the effect of bandwidth on a digital signal with suitable diagrams. **(4)**

Q.4 a. Discuss ASK and FSK techniques with suitable waveforms. Compare its performance. **(8)**

b. Explain the following characteristics to distinguish data link configurations.
(i) Topology
(ii) Half duplex and full duplex **(4+4)**

Q.5 a. Describe Go-back-N ARQ error control protocol with a suitable diagram. **(8)**

b. What do you mean by statistical Time division multiplexer? Explain with suitable diagrams. **(8)**

Q.6 a. Compare datagram circuit and Virtual circuit switching techniques with the help of timing diagrams. **(8)**

b. Discuss the mechanisms employed for congestion control with a suitable diagram. **(8)**

Q.7 a. Describe and explain the usage of a bridge to connect two LANs with the help of diagrams. **(8)**

b. Draw the IEEE 802.3 frame format and explain the function of each field. **(8)**

Q.8 a. What are the different classes of IP addressing? Explain with IPv4 address formats. **(6)**

b. Convert IP address whose hexadecimal representation is C22F1582 to dotted decimal notation. To what class this address belongs to? What is the net ID and host ID? **(6)**

c. Explain address resolution protocol (ARP). **(4)**

Q.9 a. Draw the TCP header format and explain the function of each field. **(8)**

b. Differentiate between TCP & UDP. **(4)**

c. Write an explanatory note on e-mail service. **(4)**