ROLL NO. _____

Code: DE69/DC63 Subject: DATA COMMUNICATION & NETWORKS

DipIETE – ET/CS

Time: 3 Hours **JUNE 2014** **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. The OSI layer which performs data encryption and decryption is_____.

(A) Presentation **(B)** Network
(C) Session **(D)** Transport

b. In _____ mode of operation, both stations can transmit and receive simultaneously.

(A) Simplex **(B)** Half-Duplex
(C) Full-Duplex **(D)** All of the above

c. Fiber-Optic Cable is used in _____ networks.

(A) Backbone **(B)** Cable TV
(C) Fast Ethernet **(D)** All of the above

d. An error-control method in which only the frame in error is resent is _____.

(A) Selective-Repeat ARQ **(B)** Stop-and-Wait ARQ
(C) Go-Back-N ARQ **(D)** Sliding Window ARQ

e. _____ is a bit-oriented protocol for communication over point-to-point and multipoint links.

(A) Line Control Protocol **(B)** Authentication Protocol
(C) Network Control Protocol **(D)** High-Level Data Link Control

f. Circuit Switching takes place at the _____ layer of OSI model.

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

g. A Congestion Control mechanism in which a congested node stops receiving data from the immediate upstream node or nodes is ____

(A) Choke packet **(B)** Implicit Signaling
(C) Backpressure **(D)** Explicit Signaling

h. A transmission method that allows copies of a single packet to be sent to a selected group of receivers is called as _____

(A) Unicasting **(B)** Multicasting
(C) multiple unicasting **(D)** None of these

i. A simple parity check code can detect _____ number of errors

(A) Even **(B)** Odd
(C) Multiple **(D)** Zero

j. The TCP/IP protocol defining electronic mail service on the Internet is _____

(A) Simple Mail Transfer Protocol (SMTP)
(B) Simple Network Management Protocol (SNMP)
(C) Internet Group Management Protocol (IGMP)
(D) High-level Data Link Control

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

Q.2 a. What is a network? Explain the differences between Local Area Networks and Wide Area Networks with suitable diagrams. **(8)**

b. What do you mean by OSI model? What are the various layers in this model? Mention the functions of Transport and Presentation Layer. **(8)**

Q.3 a. Define and briefly explain the following:
Data rate, Bandwidth, Noise and Error rate. **(8)**

b. What is meant by Wireless Transmission media? What are the various ways of transmission in this media? Explain Microwave Transmission. **(8)**

Q.4 a. Distinguish between analog data and digital data. **(5)**

b. How an error occurs in digital transmission systems? Discuss various types of errors that can occur. **(6)**

c. Explain digital logic of the CRC process. **(5)**

Q.5 a. Discuss Stop-and-Wait Automatic Repeat Request Protocol in detail. **(8)**

b. What is Time Division Multiplexing? Explain Statistical Time Division Multiplexing with suitable diagrams. **(8)**

Q.6 a. Explain the principle of Packet Switching network with a neat Diagram. **(5)**

b. Compare the differences between Adaptive Routing and Fixed Routing. **(5)**

c. Briefly explain three general categories of explicit congestion signalling approach. **(6)**

Q.7 a. Categorize the topologies used in LANs and explain briefly about Bus Topology with a diagram. **(6)**

b. What is the need for Fast Ethernet? What are its main features? Why is there no need for CSMA/CD in Fast Ethernet? **(6)**

c. What is Bluetooth? What are its Applications? **(4)**

Q.8 a. Explain the principle of Internetworking with a neat diagram. **(6)**

b. What is IPv4? What are the deficiencies in IPv4? **(6)**

c. Explain the reason for the elimination of the checksum in the IPv6 header. **(4)**

Q.9 Write short notes on any **TWO** of the following:- **(8×2)**

(i) Multicast Routing Protocols
(ii) User Datagram Protocol (UDP)
(iii) Electronic Mail