AMIETE – ET/CS/IT (NEW SCHEME) - Code: AE71/AC67/AT67

Subject: DATA COMMUNICATION & COMPUTER NETWORKS

JUNE 2010

Time: 3 Hours **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.**
- **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 information to be communicated in a data communication system is the _____.

(A) medium **(B)** protocol
(C) message **(D)** transmission

b. As the data packet moves from the upper to the lower layer, headers are_____.

(A) added **(B)** removed
(C) rearranged **(D)** modified

c. ASK, FSK and PSK are examples of_____

(A) Digital data, Digital signal **(B)** Analog data, Digital signal
(C) Digital data, Analog signal **(D)** Analog data, Analog signal

d. If the data unit is 111111, the divisor 1010, and the reminder 110, what is the dividend at the receiver?

(A) 111111011 **(B)** 111111110
(C) 1010110 **(D)** 110111111

e. The HDLC_____field defines the beginning and end of a frame

(A) Flag **(B)** Address
(C) Control **(D)** FCS

f. In TDM, for 'n' signal sources of the same data rate, each frame contains_____slots

(A) n **(B)** (n+1)
(C) (n–1) **(D)** 0 to n

g. In_____, each packet of a message need not follow the same path from sender to receiver

(A) Circuit switching
(B) The virtual approach to packet switching
(C) Message switching

(D) The datagram approach to packet switching

h. QDcount and AMcount belong to _____ application layer protocol

(A) DNS **(B)** SMTP
(C) HTTP **(D)** FTP

i. IP address in IPv4 consists of_____bits

(A) 4 **(B)** 8
(C) 32 **(D)** 128

j. UDP and TCP are both_____layer protocols

(A) physical **(B)** data link
(C) network **(D)** transport

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

Q.2 a. Explain the key elements and internet architecture with suitable diagrams. **(4+4)**

b. Discuss service primitives and parameters with time sequence diagrams. **(8)**

Q.3 a. Define analog and digital signals. Explain analog and digital transmission techniques. **(4)**

b. Explain various types of transmission impairments. **(4)**

c. Given a channel with an intended capacity of 20 Mbps, the bandwidth of the channel is 3 MHz. What signal to noise ratio is required to achieve this capacity? **(4)**

d. Mention different types of guided transmission media used in computer communication? Explain any two briefly. **(4)**

Q.4 a. Explain the various digital signal encoding formats with relevant waveforms. **(8)**

b. Compare synchronous and asynchronous transmission used in data communication. **(4)**

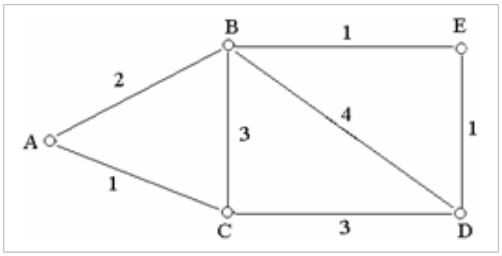
c. If the generator polynomial is x^4+x+1 and the message bits are 1101101, obtain the CRC code. **(4)**

Q.5 a. What is the basis for stop-and-wait ARQ? Explain with a diagram. **(8)**

b. Compare synchronous time division multiplexing and statistical time division multiplexing. Draw relevant diagram for each. **(8)**

Q.6 a. Compare circuit and packet switching with the help of event timing diagram. Mention their advantages and disadvantages? **(7)**

b. Find the shortest path from A to D for the network shown using Dijkstra's algorithm. **(5)**



c. How is congestion controlled by a choke packet? What is its disadvantage? **(4)**

Q.7 a. List four common LAN topologies and explain briefly their operations. **(6)**

b. Explain the IEEE 802.3 frame format. **(6)**

c. List key requirements for wireless LANs. **(4)**

Q.8 a. Draw IPv4 header format and explain various fields. **(8)**

b. In IPv4, class B network has a subnet mask of 255.255.240.0. What is the maximum number of hosts per subnet? **(4)**

c. Differentiate between IPv4 and IPv6. **(4)**

Q.9 a. Explain OSPF protocol with the example of an autonomous system **(8)**

b. Explain basic electronic mail operations. Give the functionality of SMTP and MIME used in electronic mail. **(8)**