

Code: AE28

Subject: COMPUTER NETWORKS

**AMIETE – ET (OLD SCHEME)**

Time: 3 Hours

**JUNE 2012**

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. A \_\_\_\_\_ is set of rules that govern data communication with key elements such as syntax, semantics and timing.
- (A) topology (B) protocol  
(C) data flow (D) transmission media
- b. The data link layer in each station tells its physical layer to make a bandpass signal from the data passed to it. The signal must be created in the allocated band. This is a feature of
- (A) Code Division Multiple Access (B) Time Division Multiple Access  
(C) Frame Division Multiple Access (D) Frequency Division Multiple Access
- c. In CRC-based framing, the Generic Framing Procedure (GFP) receiver synchronizes to the GFP frame boundary through a three-state process. The receiver is initially in the \_\_\_\_\_ state.
- (A) hunt (B) pre-sync  
(C) idle (D) sync
- d. Suppose that the ALOHA protocol is used to share a 56 kbps satellite channel and frames are 1000 bits long. The maximum throughput of the system in frames/second is
- (A) 10 (B) 100  
(C) 200 (D) 20
- e. In the following routing, nodes cooperate by means of message exchanges and perform their own routing computations.
- (A) static (B) dynamic  
(C) distributed (D) centralized

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- f. An arbitrary prefix length to indicate the network number is used in
- (A) ADR (B) CIDR  
(C) CMR (D) CIR
- g. The following establishes and maintains the boundaries of the ATM cells in the bit stream.
- (A) Physical medium dependent sublayer  
(B) Physical convergence sublayer  
(C) Transmission convergence sublayer  
(D) Transmission control sublayer
- h. SMI and MIB are components of
- (A) STMP (B) SMTP  
(C) MIME (D) SNMP
- i. Per flow service is replaced with per aggregate service and processing is moved from core of the network to the edge of the network. This feature is used in \_\_\_\_\_
- (A) differentiated service (B) RSVP  
(C) intserv model (D) Mobile IP
- j. The following is a variation of source routing that allows a particular node to determine the path.
- (A) Distance vector routing (B) explicit routing  
(C) link state routing (D) implicit routing

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

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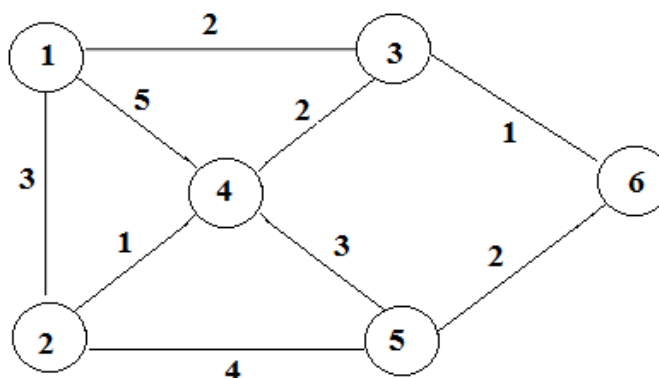
- Q.2** a. Explain the OSI reference model and give its respective block diagram. (5)
- b. Compare and contrast ADSL and xDSL. Give their respective applications. (5)
- c. Explain the working of synchronous TDM and statistical TDM. (6)
- Q.3** a. Write short notes for the following service models in peer-to-peer protocols:
- (i) Connection oriented transfer (6)
- (ii) Connectionless transfer (6)
- b. Explain the working of Go-Back-N ARQ protocol. (6)
- c. Draw the control field format for HDLC data link control. (4)
- Q.4** a. Explain various multiple access communications and their respective metrics. (6)

- b. Give the format for IEEE 802.3 MAC frame. (4)
- c. Suppose that a group of 32 stations is serviced by a token-ring LAN. For the following case - 1000 bit frame; 10 Mbps speed; 2.5-bit latency per adapter; 50 meters between stations, calculate the time it takes to transfer a frame using the three token reinsertion strategies:
- after completion of transmission;
  - after return of token;
  - after return of frame.
- (6)

**Q.5** a. Explain delay mechanism for the following:

- Datagram packet switching
  - Virtual circuit packet switching
- (6)

b. Consider the network given below:



- User Bellman-Ford algorithm to find the set of shortest paths from all nodes the destination node 2. Draw the corresponding sequence of steps and give the graph representation.
  - Continue the above algorithm after the link between node 2 and node 4 goes down. Draw the corresponding sequence of steps and give the graph representation.
- (10)

**Q.6** a. Explain the working of dynamic host configuration protocol. (4)

b. Explain how routing optimization is achieved in mobile IP. (6)

c. Mention various attributes in multicast routing. (3)

d. Draw ATM addressing format. (3)

**Q.7** a. Explain how PNNI routing works for both intradomain and interdomain routing protocols. (6)

b. Compare the characteristic features of AAL1 to AAL5 in ATM networks. (6)

c. Draw the block diagram of symmetric encryption and decryption. Mention the role of keys. (4)

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- Q.8** a. Explain the features of digital signature. Perform encryption and decryption using RSA algorithm for the following:  $p = 11$ ,  $q = 13$ ,  $e = 11$ ,  $M = 7$  (6)
- b. Give the applications of MIME. Mention any two content types in MIME. (6)
- c. Describe briefly the role of controlled load service in internet integrated services. (4)
- Q.9** a. Explain the working of message exchange in session initiation protocol. (6)
- b. Write short note of the following: (2×5)
- (i) Real time Transport Protocol (RTP) packet format
  - (ii) Essential features of Network Architecture