ROLL NO. _____

Code: AE28 **Subject: COMPUTER NETWORKS**

AMIETE – ET (OLD SCHEME)

DECEMBER 2011

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

NOTE: There are 9 Questions in all.

- **Please write your Roll No. at the space provided on each page immediately after receiving the Question Paper.**
- **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. In TCP/IP architecture, the protocols which operate over UDP are:

(A) DNS & SNTP **(B)** DNS & HTTP
(C) DNS & SMTP **(D)** DNS & RTP

b. Fixed bandwidth is used in

(A) circuit switching **(B)** datagram switching
(C) virtual circuit switching **(D)** ATM switching

c. ---------- ARQ protocol is inefficient when the time to receive an ACK is large compared to the frame transmission time.

(A) Go-back-N **(B)** Stop-and-wait
(C) Selective Repeat **(D)** Go-back-and-Repeat

d. With probability p, a station transmits its frame and with probability $1 - p$, the station decides to wait an additional propagation delay before sensing the channel. This feature is used in:

(A) Non-persistence CSMA **(B)** 1-persistent CSMA
(C) Persistent CSMA **(D)** p-persistent CSMA

e. ---------- is a collocated set of high speed routers through which the routers from different ISPs can exchange traffic and are crucial to the interconnectivity provided by the internet.

(A) ATM **(B)** VPN
(C) NAP **(D)** MLPS

f. Internal router, area border router, backbone router and autonomous system boundary router are used in

(A) Point-to-point protocol **(B)** Open Shortest Path First
(C) Reverse-path Routing **(D)** Routing Information Protocol

g. The average number of cells per second that are delivered by mistake to a given connection destination is

(A) CMR **(B)** CLR
(C) CIR **(D)** CER 2

h. A ---------- is a state organization that binds a public key to an entity and issues a certificate.

(A) State Authority **(B)** Cryptographic Authority
(C) Certification Authority **(D)** All of the above

i. Among the six methods provided by Session Initiation Protocol (SIP), ---------- & -------- are the most basic methods used to initiate calls.

(A) ACK & REGISTER **(B)** BYE & INVITE
(C) OPTIONS & INVITE **(D)** ACK & INVITE

j. Prune message and graft message schemes are used in _____.

(A) Forward path multicasting **(B)** Reverse path multicasting
(C) Back bone multicasting **(D)** Internal group multicasting

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

Q.2 a. Explain TCP/IP architecture with the relevant diagram. **(6)**

b. Compare any six features of circuit switching, datagram packet switching and virtual circuit packet switching. **(6)**

c. Explain the working mechanism of FDM. **(4)**

Q.3 a. Explain the functioning of peer-to-peer protocols for the following:
(i) Hop-by-hop
(ii) End-to-end **(6)**

b. Draw the graphical representation for transmission errors in stop-and-wait ARQ protocol for the following:
(i) Possible ambiguities when frames are unnumbered
(ii) Possible ambiguities when ACKs unnumbered **(6)**

c. Mention various HDLC configurations and transfer modes. **(4)**

Q.4 a. Explain the operations of reservation system in scheduling approaches to medium access control for negligible and non-negligible delays. Give the respective equations. **(5)**

b. Mention protocol standards for IEEE 802 LAN. Give the characteristic features of the following:
(i) Medium access control sublayer
(ii) Logical link control sublayer **(2+6)**

c. Can a router be used to provide the distribution service in an IEEE 802.11 extended service set? If so, explain how addressing is handled and give an example of how the frames are transferred between BSSs. **(3)**

Q.5 a. Compare the following shortest path routing techniques and give their applications:
(i) Bellaman-Ford algorithm (ii) Dijkstra algorithm **(7)**

b. Perform CIDR aggregation on the following /24 IP addresses: 128.56.24.0/24; 128.56.25.0./24; 128.56.26.0/24; 128.56.27.0/24. **(5)**

c. Explain Little's formula for arrival and departures of data packets in FIFO system. **(4)**

Q.6 a. Mention the migration issues from IPv4 to IPv6. Draw the tunnelling mechanism for IPv6 over IPv4. **(3+3)**

b. Compare and contrast the functioning of TCP and UDP. Give their respective applications. **(6)**

c. Discuss the operation of the reverse-path multicasting for the following two cases:
(i) The membership in the multicast group in the network is dense
(ii) The membership in the multicast group in the network is sparse **(4)**

Q.7 a. Mention various QoS and traffic descriptors in ATM. **(4+3)**

b. Give sequence of steps to illustrate UNI signalling mechanism in ATM networks. **(5)**

c. How much delay is introduced by the two interleaving techniques in AALI?**(4)**

Q.8 a. Explain various types of key distribution techniques. **(5)**

b. Give the frame formats for the following:
(i) IPSec Authentication header
(ii) IPSec ESP format **(6)**

c. Explain the working of HTTP operations. Give the structure of HTTP message. **(3+2)**

Q.9 a. Explain how soft state features of RSVP allow it to adapt to failures in the network. **(4)**

b. Mention the features of Label Stack and LSP Hierarchy of MPLS domain. **(6)**

c. Write short notes for any **TWO** of the following:
(i) Structure of packet switch
(ii) SNMP Configuration
(iii) Reverse path multicasting **(2×3 = 6)**