Printed Pages : 4 MCA505(1)

(Following Paper ID and Roll No. to be filled in your Answer Book)

PAPER ID : 1443 Roll No.

M.C.A

(SEM V) ODD SEMESTER THEORY EXAMINATION 2009-10
ADVANCED COMPUTER NETWORKS

Time : 3 Hours] *[Total Marks : 100*

Note : *(i) Attempt **all** the questions.*

*(ii) Each question carries **equal** marks.*

1 Attempt any **four** parts of the following : **5×4=20**

(a) Discuss the need or lack of need for a network layer (OSI layer 3) in a broadcast network.

(b) How does CSMA/CD differ from CSMA/CA ? Draw a flow chart to depict CSMA/CA procedure.

(c) What are the common fast Ethernet and Gigabit Ethernet implementations ? Explain each in brief.

(d) What are the three types of frames used by Wireless LAN ? Explain the purpose of NAV.

(e) Explain the following :

(i) ADSL

(ii) SDSL

(iii) VDSL

(iv) Cable Modem

(v) HIPPI

2 Attempt any **four** of the following : **5×4=20**

(a) A 4480-octet datagram is to be transmitted and needs to be fragmented because it will pass through an Ethernet with a maximum payload of 1500 octets. Show the total length, More flag, and fragment offset values in each of the resulting fragments.

(b) Compare the individual fields of the IPv4 header with the IPv6 header.

(c) List key design requirements for IP-based internets.

(d) IPv6 uses 16-byte addresses. If a block of 1 million addresses is allocated every picosecond, how long will the addresses last ?

(e) Explain the following :

(i) Address Autoconfiguration

(ii) Name to address translation

(f) Describe some IPv6 APIs available in the standard libraries.

3 Attempt any **two** parts of the following : **10×2=20**

(a) What are four different forms of IP addressing ? Compare and contrast IGMP protocol with PIM protocol.

(b) What are general problems of mobile IP regarding security and support of quality of service. Explain in detail.

(c) List the entities of mobile IP and describe data transfer from a mobile node to a fixed node and vice-versa. Why and where is encapsulation needed ?

(i) retransmission

(ii) Persistance

(iii) Keep alive

(iv) Time waited

Explain each in brief.

Attempt any **two** parts of the following : **10×2**

(a) Using the RSA public key cryptosystem, with a = 1, b = 2, etc.

(i) If p = 7 and q = 11, list five legal values for d.

(ii) If p = 13, q = 31 and d = 7, find l.

(iii) Using p = 5, q = 11 and d = 27, find e and encrypt "abcdefghi".

4 Attempt any **two** parts of the following : **10×2**

(a) Explain the following algorithm.

(i) Jacobson's algorithm for RTT variance estimation

(ii) Dynamic Window sizing on congestion

(b) (i) In a credit flow control scheme such as TCP's. What provision can be made for credit allocations that are lost or misordered in transit ?

(ii) Why is the TCP window scale option limited to a maximum value of 14 ?

(c) TCP uses the following four timers to perform its operation smoothly :

(i) retransmission

(ii) Persistance

(iii) Keep alive

(iv) Time waited

Explain each in brief.

5 Attempt any **two** parts of the following : **10×2**

(a) Using the RSA public key cryptosystem, with a = 1, b = 2, etc.

(i) If p = 7 and q = 11, list five legal values for d.

(ii) If p = 13, q = 31 and d = 7, find l.

(iii) Using p = 5, q = 11 and d = 27, find e and encrypt "abcdefghi".

(b) The Diffie-Hellman key exchange is being used to establish a secret key between Alice and Bob. Alice sends Bob (719, 3, 191,). Bob responds with (543). Alice's secret number, x, is 16. What is the secret key ?

(c) Write short notes on any two of the following :

(i) Digital signature

(ii) Authentication header

(iii) SSL.