

**BACHELOR IN COMPUTER  
APPLICATIONS****Term-End Examination****December, 2008****BCS-061 : TCP/IP PROGRAMMING***Time : 2 hours**Maximum Marks : 60*

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**Note :** Question number 1 is **compulsory**. Answer any **three** questions from the rest.

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1. (a) Assume you have a Class A address and you need to divide into 1000 subnetworks with maximum possible number of hosts in each subnet. Calculate and assign the mask for it. 5
- (b) How does SMTP operate ? 5
- (c) System calls close() and shutdown() both are used to close a socket. Give an example to show how these system calls differ. Also, explain which one is graceful. 5

(d) Write an algorithm each for TCP Client and Server with the following specifications : 10

(i) Client program prompts the user to enter a series of numbers (after authentication from server) and send these numbers to the TCP Server.

(ii) TCP Server should be able to handle multiple clients and send the sum of given numbers, prefixed with the user name.

**Note :** Assume you have the list of users in the Server database.

(e) Explain the working of Sliding Window protocol with an example. Show the window status at sender and receiver in the example. 5

2. (a) How do the problems arise due to unreliability and connectionless behaviour of IP ? 6

(b) What are fields in TCP which handle the following issues : 4

(i) When the segment contains urgent data.

(ii) Header length is to be specified.

(iii) To specify the size of window maintained by the other party.

(iv) To specify the source port number.

3. (a) How does ARP resolve an IP address to an Ethernet MAC address ? Also, write how it resembles with RARP. 5
- (b) What does fragment offset field in the header of IP datagram represent ? Also, explain the maximum number of fragments that can result from a single IP datagram. 5
4. (a) Give an example to explain the count-to-infinity problem in distance vector routing. Also, give a solution for count-to-infinity problem. 5
- (b) Differentiate between the following : 5
- (i) Stateful and Stateless servers
  - (ii) Big endian and Little endian byte ordering
5. Explain the syntax of the following system calls alongwith the meaning of parameters used by them : 10
- (i) `accept( )`
  - (ii) `setsockopt( )`
  - (iii) `getservbyname( )`
  - (iv) `inet_ntoa( )`
  - (v) `writev( )`

