This question paper contains 4+2 printed pages]

Your Roll No.....

1956

B.Sc. (Hons.) Computer Science/VI Sem. C

Paper 602--Networks Programming and Administration

(Admissions of 2001 and onwards)

Time : 3 *Hours* *Maximum Marks* : 75

(Write your Roll No. on the top immediately on receipt of this question paper.)

Section A is compulsory.

Attempt any *four* questions from Section B.

Section A

(35 Marks)

1. (*a*) Represent the data 0 × 1020 in big endian and little endian format. Which byte ordering is used in network byte order and host byte order ? 2+2

P.T.O.

(*b*) What is the default behavior of close socket call ? How can it be changed in a socket application ? 2+2

(*c*) Write a program to check whether SMTP and HTTP services are running on a host. If the services are supported, then print their respective port numbers. 2+1

2. (*a*) What is the size of a packet sent in ping command ? Write ping command to send a packet which forces fragmentation. 1+1

(*b*) Describe the purpose of SIGCHLD signal ? Who sends the signal ? How is it handled ? 2+1+2

(*c*) Write a procedure to implement a TCP client working on the IP address 192.168.11.0 and a wild card port number. Client connects to server with address 202.13.5.8 and port number 2025. Client sends a message "Hello" and terminates. 5

3. (*a*) Differentiate wait and waitpid system calls. 3

(*b*) What does blocking call mean ? Is recv system call blocking ? Can we put a time limit on the recv system call ? Explain. 1+1+1+2

(*c*) Explain IP forwarding and IP spoofing. What are the network security issues in both the cases ? 2+2

Section B

(40 Marks)

4. (*a*) What is active open and passive open connection in case of TCP ? 3

(*b*) Write implementation of a TCP concurrent server with the following specifications : Server binds on 192.168.23.18 and port number 5023. When a client connects, server prints the client's address and sends a message "connection OK" to client. Server counts the number of the clients connected and prints that number whenever a client connects. 7

5. (*a*) What are half open connections ? How are they detected in a socket application ? 2+2

(*b*) Describe connected UDP socket. List the advantages and disadvantages of using connect in UDP. What is the purpose of specifying AF_UNSPEC in family field of address in UDP socket ? 2+3+1

6. (*a*) What are the return value of connect socket call ? 2

(*b*) Describe the socket send buffer and socket receive buffer. Explain the concept of low water mark in these buffers and write their default values. How can they be changed ? 2+2+1+1

(*c*) Explain the working of traceroute system call. 2

7. (*a*) Explain the different values of timeval structure in select socket call. 3

(*b*) Give the network commands with appropriate parameters to perform the following operations : 5

(*i*) Enable or disable a network interface.

(*ii*) Configure a default route.

(*iii*) Examine the routing table

(*iv*) Monitor status of network connections.

(*v*) Inspect all network interfaces.

(*c*) Why errno variable is used in case of Unix system calls ? 2

8. (*a*) What is maxfdpl argument of select system call ? How is this value changed ? 1+1

(*b*) Explain the prototype of inet_addr system call. Why is it deprecated ? 2+1

(*c*) Describe the conditions under which a socket descriptor becomes ready for reading and writing. 3+2

9. (*a*) What is the purpose of listen socket call ? Explain the significance of backlog parameter. 2+2

(*b*) Explain the denial of service attack. What are the possible solutions to prevent this problem ? 1+2

(*c*) What is meant by Descriptor reference count in case of sockets ? How is this value changed ? 2+1