

OS 2014

[This question paper contains 4 printed pages.]

6133

Your Roll No.

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

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 4 questions from Section B.

SECTION A (35 Marks)

1. (a) What is a socket pair ? Explain with an example.
(2+1)
- (b) What are the differences between close and
shutdown system calls ? (3)
- (c) Write a procedure to implement UDP client with
the following specifications.
 - (i) Client sends a message "hello" to the server
with IP address 202.68.10.3 and port no 1025
and waits for a response.
 - (ii) When a response is received, then UDP client
checks whether the response is from the same
server.

P.T.O.

- (iii) If response is from a different server then client prints "discarded message" and quits. (2+2+2)
2. (a) Write a program to check whether FTP and HTTP services are running on a host. If the services are supported then print their respective port numbers. (2+1)
- (b) What do we mean by broadcast ping and IP spoofing? What are the network security issues in both the cases? (2+2)
- (c) What is TCP_KEEPALIVE socket option? What is its purpose? (2+2)
3. (a) What are the differences between wait and waitpid system calls? Explain with a diagram. (4)
- (b) An application is trying to bind on an IP address 202.34.12.1. Bind call fails with an error EADDRINUSE. Explain the output. What change can prevent this error to happen? (2+2)
- (c) Discuss the hard error and soft error returned by a connect socket call. (2+2)

SECTION B (40 Marks)

4. (a) Can we restrict UDP to communicate with only one peer at a time? Explain. (1+3)
- (b) Explain the role of TTL field in case of traceroute system call. (2)

- (c) A server was started and bound on IP address 192.168.10.1 and port number 1025. A client connects to it and a child process is started. The server process terminates. After some time, server was started again on the same port number and IP address. Is it allowed? Give reason. If not, how can this situation be handled? (1+1+2)
5. (a) Explain the parameters of select system call. How is it different from pselect system call? (3+1)
- (b) Explain the output of ping utility. (2)
- (c) Define zombie state. Why a system should avoid zombies? Write a procedure to avoid zombies using wait system call. (1+1+2)
6. (a) What is the purpose of routing tables in a network? Give commands to:
- (i) Add a route to the routing table with IP address 192.168.10.0, netmask 255.255.255.0 and gateway 192.168.10.254.
- (ii) Add a default route.
- (iii) Display routing table using netstat. Show the output also. (1+1+1+2)
- (b) Write a procedure to display the name of the service running on port number 35. (2)
- (c) What is the purpose of SO_LINGER option in case of close socket call? (3)

7. (a) What is a slow system call? When the error EINTR is returned by such a call? (2+2)
- (b) Write a procedure to implement UDP server with the following specifications :
- (i) Server binds on IP address 202.68.10.3 and port number 1025.
 - (ii) On receiving a datagram from a client, it prints the client's IP address and port number.
 - (iii) It sends a message "OK" to the client and starts waiting for a datagram again. (2+2+2)
8. (a) What is a signal? Explain the disposition of a signal? Write the signal function that calls sigaction function. (1+2+2)
- (b) What is the purpose of getpeername socket call? Explain. (3)
- (c) Explain TIME_WAIT state in case of TCP. (2)
9. (a) What is the difference between listening socket and connected socket? Explain with reference to accept system call. (5)
- (b) What are packet sniffers? Give two examples. (2)
- (c) What is the purpose of ifconfig command? Give ifconfig command for configuring the loopback interface. (2+1)