POKHARA UNIVERSITY

Time Bound Open Book Hybrid Examination

Level: Bachelor	Semester: Spring, 2020	Full Marks: 70
Programme: BE Software		Pass Marks: 31.5
Course: Network Programming		Time : 2 hrs.

Candidates are required to give their answers in their own words as far as practicable. The figures in the margin indicate full marks.

Attempt all the questions.

1. Think about any client/server application that should exchange data on the basis of reliable communication protocol. Based on your application, explain the complete process of communication mechanism between client and server with example function and protocol states of both client and server. 10

2. What is the significance of casting any of the supported protocol families to generic socket addresses while calling different socket APIs? Also, explain those socket APIs in detail. Why different socket APIs always return some positive or negative number? Explain the conditions to wait for some process to terminate until its child process is terminated? 10

OR

Is it necessary to call bind() function for both client and server in unix network programming? Explain with suitable example code to show the mechanism of passing length of socket address structure in different functions.

3. With an example scenario, explain the differences between a connected UDP socket and unconnected UDP socket. How do you use pure and hybrid asynchronous IO models in Unix socket? Explain how can you make your socket to select incoming and/or outgoing data is ready until finite time, no time, and indefinite time. 10

4. What are the major advantages of windows socket over Unix socket? How windows socket implements the notion of asynchronous socket? Explain various asynchronous database functions in windsock. 10

5. Write a simple client-server chat application program using windsock programming. What will happen if you call shutdown() and close() function? Do these functions are different from WSACleanup() function? Example how/how not. 10

6. Design and implement TCP Client and TCP Server applications for providing registration numbers to the users. 20

Requirement:

1. The server contains a text file having one line of information about users (total 10 lines user information in the filename as **users.txt**). File content

Example: 1. Welcome <<Yourname>>, your unique identification key is <<Registration No.>>

1.1. Replace <<Yourname>> and <<Registration No>> by any sample value for sample file and output.

2. The client establishes a connection to the server with its **unique ID number** (**use your roll no**) send via command-line argument during sending a connection request.

3. The Server sends user information on the basis of provided ID number. Use division operation by 11 (i,e: ID no %11) to find the line number to find the contents.

4. Use the line number calculated as above to find the information and send that information to the respective client.

5. Server also send asking information immediately after sending registration no.

6. Your server must support multiple simultaneous connections. The server must also ask the client after the first information if he wishes to see the same information again.

7. If a client wants to quit, take input 'quit' from the console, and the client terminates. If a client wants to see the same information again, input 'Again' from the console and send a request to the server.

8. Your server must not support more than 10 simultaneous clients.

Use select() statement to check if the input is coming from the keyboard or from which of the clients.

- The server is started with:

tcpInfoServer –p port

- The client is started with:

tcpInfoClient –h serveraddress -p port -n IDNumber

Use the following messaging rules:
Information messages from the server to client

1Welcome <<Yourname>>, your unique identification key is <<Registration No.>>

3Do you want to see your information again?

Message from client to sever to see information repetitively
2Again