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3 (Sem-6 /CBCS) CSC HE 1

2022

COMPUTER SCIENCE

(Honours Elective)

Paper : CSC-HE-6016

(Network Programming)

Full Marks : 60

Time : Three hours

***The figures in the margin indicate
full marks for the questions.***

1. Answer the following questions as directed : **(any seven)** $1 \times 7 = 7$

(a) What is the full form of TCP?

(b) A _____ is one endpoint of a two-way communication link between two programs running on the network.

Contd.

(c) A socket is bound to a port number so that the TCP layer can identify the application that data is destined to be sent to.
(State True/False)

(d) _____ is a connection-oriented protocol which provides message-oriented data transfer.

(e) The listen () function applies to both stream and datagram sockets.
(State True/False)

(f) ICMP stands for _____.

(g) HTTP is a _____ layer protocol.

(h) In POP3 protocol, received emails are often deleted from the server.
(State True/False)

(i) Remote logging is implemented using _____ protocol.

(j) Linux is a free, open-source operating system.
(State True/False)

2. Answer the following questions : **(any four)**
 $2 \times 4 = 8$

(a) Write *two* characteristics of user datagram protocol.

(b) Write the use of *any two* functions :
inet_aton, inet_addr, inet_ntoa,
inet_pton, inet_ntop

(c) Define URL. What is it used for?

(d) How does remote login differ from local login?

(e) What is address resolution protocol?

(f) Write the use of any two commands :
hostname, ifconfig, ping, traceroute,
netstat

(g) Write *any two* security issues with IP networking.

(h) What is WWW? How does it differ from the Internet?

3. Answer the following questions : **(any three)**
 $5 \times 3 = 15$

(a) Differentiate between TCP and UDP.

- (b) Explain in brief the socket() function in socket programming API with an example.
- (c) Write a program that prints the details of a particular host, when only the hostname is supplied by the user.
- (d) What is HTTP? State and explain any five HTTP commands.
- (e) Write a short note on TCP/IP protocol suite.
- (f) How can we set and get the socket options? Explain in brief any two socket options.
- (g) Write a short note on SCTP and its advantages/disadvantages.
- (h) Write the basic steps to add a new machine to an existing local area network.

4. Answer the following questions : **(any three)**

10×3=30

- (a) Explain the three-way handshake mechanism of TCP in detail.
- (b) Describe the working of the TELNET protocol.
- (c) Explain the email architecture in detail.
- (d) Write a program to implement TCP echo server, which reads the filename sent by the client and checks if a file with the given filename is present on the server. If the file is present, the server sends the message — “File is found on the server” to the client. In case the file is not present, the server returns the following message back to the client : “File Not Found! Kindly check the filename.”
Assume that the server IP address is 127.0.0.1 and port number is 8000.

(e) Write a program to print the details of a particular service (For e.g., Name, Port and Protocol), when only the service name and protocol (optional) are supplied by the user.

(f) Explain *any two* of the following in detail :

(a) POP3

(b) SMTP

(c) IMAP

(d) Web-based Emails

(g) Write a UDP server-client program. The client sends a sentence to the server. The server counts the number of vowels and the total number of characters in the sentence (including spaces and punctuation marks, if any) and returns the result back to the client. The client then displays the result.

(h) Explain how I/O multiplexing is carried out using select and poll functions.