No. of Printed Pages : 2

BCS-052

01817

BCA

Term-End Examination

December, 2013

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 hours *Maximum Marks : 100*

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

1. (a) What is a purpose of "Type of Service" field used in the header of IP datagram ? Also, explain the maximum number of hops that a datagram can remain in, in the network before it is discarded. 5

   (b) For what purpose function **"getservbyname()"** is used in context of socket programming. Also, explain it's syntax and different parameter taken by it. 5

   (c) Describe any two mechanisms used by TCP for flow control. 5

   (d) What is HTTP ? Explain any four methods used by HTTP for data transfer. 5

   (e) Differentiate between POP and IMAP protocols. 5

   (f) Explain the similarities and differences between ARP and RARP. 5

   (g) Discuss the cloud computing model. 5

   (h) What is Virtual Network Computing (VPN) ? Compare VPN with FreeNX. 5

2. (a) What kinds of segments are used in connection establishment and termination using 3-way handshaking in TCP ? Explain through a suitable diagram. **10**

(b) What are the various IP address classes ? How many bits are used to represent the network ID and host ID part of these classes. **10**

3. Write an algorithm each for TCP client and server with the following specification. **20**

- TCP Server can handle maximum 5 clients at a time.
- TCP client will initiate the communication and send any alphanumeric character randomly to the server.
- TCP server accepts the character and as a reply it sends the ASCII value of that character to the respective client.

Note : Make suitable assumptions, if any.

4. (a) Explain the count-to-infinity problem related to distance vector routing with the help of an example. **5**

(b) Write the syntax along with parameters used by **listen()** and **accept()** system call. **5**

(c) What is DHCP ? Explain the working of DHCP with the activities performed between DHCP Server and DHCP Client. **10**

5. Differentiate between the following : **20**

(a) TCP/IP and OSI Model

(b) IPv4 and IPv6

(c) Primary name server and Secondary name server

(d) FAT16 and FAT32

No. of Printed Pages : 2

BCS-052

01811

BCA

Term-End Examination

December, 2013

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 hours *Maximum Marks : 100*

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

1. (a) What is a purpose of "Type of Service" field used in the header of IP datagram ? Also, explain the maximum number of hops that a datagram can remain in, in the network before it is discarded. **5**

(b) For what purpose function **"getservbyname()"** is used in context of socket programming. Also, explain it's syntax and different parameter taken by it. **5**

(c) Describe any two mechanisms used by TCP for flow control. **5**

(d) What is HTTP ? Explain any four methods used by HTTP for data transfer. **5**

(e) Differentiate between POP and IMAP protocols. **5**

(f) Explain the similarities and differences between ARP and RARP. **5**

(g) Discuss the cloud computing model. **5**

(h) What is Virtual Network Computing (VPN) ? Compare VPN with FreeNX. **5**

2. (a) What kinds of segments are used in connection establishment and termination using 3-way handshaking in TCP ? Explain through a suitable diagram. **10**

(b) What are the various IP address classes ? How many bits are used to represent the network ID and host ID part of these classes. **10**

3. Write an algorithm each for TCP client and server with the following specification. **20**

- TCP Server can handle maximum 5 clients at a time.
- TCP client will initiate the communication and send any alphanumeric character randomly to the server.
- TCP server accepts the character and as a reply it sends the ASCII value of that character to the respective client.

Note : Make suitable assumptions, if any.

4. (a) Explain the count-to-infinity problem related to distance vector routing with the help of an example. **5**

(b) Write the syntax along with parameters used by **listen()** and **accept()** system call. **5**

(c) What is DHCP ? Explain the working of DHCP with the activities performed between DHCP Server and DHCP Client. **10**

5. Differentiate between the following : **20**

(a) TCP/IP and OSI Model

(b) IPv4 and IPv6

(c) Primary name server and Secondary name server

(d) FAT16 and FAT32

03703

BCA

Term-End Examination

June, 2014

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 hours *Maximum Marks : 100*

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

1. (a) What is the maximum capacity of datagram can be carried by Internet protocol ? Also, explain, how IP datagram are deleted from the network. **5**

(b) The following is the TCP header in hexadecimal format : **10**

04321017 01231311 00000234

62324216 00134217

(i) What is the destination port number ?

(ii) What is the sequence number ?

(iii) What is the source port number ?

(iv) What is the length of TCP header ?

(v) What is the acknowledgement number ?

(c) What is ICMP ? Explain the network informations it carries. 5

(d) Which field of IP header is used for Congestion Control and how ? 5

(e) Why and how broadcasting is used in ARP ? 5

(f) Write any five disk management functions. 5

(g) How the "Disc User" is checked in Linux ? Explain with an example. 5

2. (a) "Internet protocol is an unreliable, best effort, connection - less protocol". Explain the meaning of the above statement. 3

(b) What are the data types defined by socket interface ? Also, explain the purpose of any four. 7

(c) What is meant by byte - ordering ? For what purpose following socket calls are used ? Explain using an example for each. 10

(i) htons ( ) (ii) htonl ( )

(iii) ntohs ( ) (iv) ntohl ( )

3. Write an algorithm for TCP client and server each using the following specifications : 20

(a) Client program initiate the communication. After authentication from the server, it sends a range of numbers (e.g. 10 to 100) to the server.

(b) TCP server, which can handle maximum 4 clients, accept the range of numbers from the client. As a reply it send a list of prime numbers (if any) to the respective client.

Note : Make suitable assumptions, if any.

4. (a) Compare and contrast between TCP/IP and OSI model. Also, draw the layer diagram for each model. **10**

(b) Write the step by step procedure to configure a Samba Server. Assume server IP address is 192.162.0.252 and server machine name is "IGNOU". **10**

Note : Make suitable assumption for clients IP and name .

5. Differenciate between the following : **20**

(a) Gateways and Bridges

(b) TCP and UDP

(c) Authentication and Authorization

(d) SOCK_STREAM ( ) and
SOCK_DGRAM ( )

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BCS-052

BACHELOR OF COMPUTER APPLICATIONS (Revised)

Term-End Examination

07264

December, 2014

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 hours *Maximum Marks : 100*

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

1. (a) What is the maximum capacity of datagram that can be carried by Internet Protocol ? Also, explain how IP datagrams are deleted from the network. 5

(b) What is meant by socket ? Write the differences between active and passive sockets. 5

(c) Differentiate between ARP and RARP. 2

(d) How does TCP handle "out-of-order" segments ? Explain. 5

(e) What is the significance of the "*Time to Live*" value in an IP header ? Explain. 5

(f) Explain the various components of a URL using an example. 5

(g) Why does lost acknowledgement not necessarily force the retransmission of TCP segment ? 5

(h) Explain the Remote login process of TELNET. 5

(i) What is the reserve bit pattern of the first byte for a Class D address ? 3

2. (a) How is flow control managed in TCP ? Explain the Sliding Window Protocol using an example. 10

(b) Explain the purpose of the following fields of the TCP and IP : 10

(i) Urgent Pointer

(ii) Window Size

(iii) Sequence Number

(iv) Fragment Offset

3. (a) What is meant by Byte ordering ? For what purpose are the following functions used ? Explain using an example of each. 10

(i) htons

(ii) htonl

(iii) ntohs

(iv) ntohl

(b) An IP address has arrived with the following first 16 bits of information in the header (binary format) as given below :

0100010101101101× × ×

Answer the following : *10*

(i) What is the size of the header ?

(ii) Are there any *options* ?

(iii) What is the precedence of Datagram ?

(iv) What type of service does this datagram contain ?

4. (a) Write the syntax and uses of "useradd" command in Linux. *6*

(b) Write an algorithm each for TCP client and TCP server, where the connection request from the client prompts the server to send the system date and time to the client for which the client will send an acknowledgement. *14*

5. Write short notes on the following : *20*

(a) DHCP

(b) VPN

(c) HTTP

(d) Voice over IP

No. of Printed Pages : 3

BCS-052

BACHELOR OF COMPUTER APPLICATIONS (BCA) (Revised)

Term-End Examination

03783

June, 2015

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 hours *Maximum Marks : 100*

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

1. (a) Do port addresses at transport layer need to be unique ? Why or why not ? Why are port addresses shorter than IP addresses ? 5

(b) What is ARP ? How does it differ from RARP and BOOTP ? Explain. 5

(c) Which field in IP header is used for congestion control and how ? Explain. 5

(d) Draw the block diagram of DNS. Explain the purpose of various fields used in DNS message format. 7

(e) In electronic mail, what is MIME ? Explain its purpose and functionality. 5

(f) How is checksum in TCP header computed ? Give an example to explain it. 5

(g) Why is layering of the protocols done in TCP/IP stack ? 3

(h) Differentiate between FAT 16 and FAT 32. 5

2. (a) Explain the purpose and importance of the following header fields of TCP and IP protocols : 10

(i) Protocol

(ii) Sequence Number

(iii) Version

(iv) Type of Service

(b) What is the purpose of byte ordering in network communication ? Also, write the functions used for byte ordering. 10

3. Write an algorithm each for UDP client and UDP server with the following specifications : 20

- Client should prompt a user to enter two numbers.
- Client program will send these numbers to the server.
- Server program will be able to handle many clients concurrently.
- Once server program receives the numbers, it will find the largest number and send it back to the respective client.

4. (a) What is the size of TCP header ? How many packets are exchanged in setting up a TCP connection ? *6*

(b) Identify the class of the following IP addresses : *4*

(i) 2.200.100.100

(ii) 130.10.120.240

(iii) 196.10.10.2

(iv) 208.10.18.203

(c) Write the syntax along with the parameters used by the following system calls : *10*

(i) accept ( )

(ii) listen ( )

(iii) send ( )

(iv) shutdown ( )

5. Write short notes on the following : *4×5=20*

(a) Network Monitoring Tools

(b) FreeNX

(c) Cloud Computing

(d) Name Servers

No. of Printed Pages : 3 07454 **BCS-052**

BACHELOR OF COMPUTER APPLICATIONS (BCA) (Revised)

Term-End Examination

December, 2015

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 hours *Maximum Marks : 100*

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

1. (a) Assume a subnet mask 255.255.0.0 is assigned to an address of Class B. How many hosts are possible per subnet and how many subnets are possible ? *5*

(b) How does TCP handle out-of-order segment ? Explain the procedure with a suitable diagram. *8*

(c) The size of the option field of an IP datagram is 20 bytes. What is the value of HLEN field ? *2*

(d) Explain the Distance vector routing algorithm with an example. *10*

(e) Explain the working of ARP and RARP using suitable diagram for each. 8

(f) What is the importance of ICMP at Network layer ? Explain the reports generated by ICMP. 7

2. Write an algorithm (using Socket Programing System Calls) for TCP client and TCP server each, as per the following specifications :

(Make suitable assumptions, if any) 20

(a) Client will start communication and establish connection. It will send a list of numbers to the TCP server.

(b) TCP server, which can handle maximum 3 clients concurrently, will accept the list and send back the smallest number. Server will terminate this connection once the number is sent.

3. (a) How does a DNS server work ? Explain with help of a suitable example for recursive and iterative solutions. 10

(b) What is SNMP ? Explain the different security levels implemented in SNMP. 10

4. (a) What are the different remote network administration tools ? Explain the features of each. 10

(b) Discuss the activities between DHCP server and DHCP client. 10

5. Differentiate between the following : 20

(a) htons( ) and ntohs( ) System Call

(b) Supernet and Subnet

(c) read( ) and write( ) System Call

(d) Broadcasting and Multicasting

No. of Printed Pages : 3

BCS-052

BACHELOR OF COMPUTER APPLICATIONS (BCA) (Revised)

Term-End Examination

June, 2016

00676

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 hours *Maximum Marks : 100*

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

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1. (a) A block of address is granted to a small organisation. One of its addresses is 205.16.27.39/28. What is the first address in the block ? *5*

(b) Explain the management components of SNMP. *8*

(c) Explain the 'MAC Sub-layer format' and 'Addressing mechanism'. *8*

(d) Find the error, if any, in each of the following IPv4 addresses : *4*

(i) 111.56.036.89

(ii) 226.14.8.5.3

(iii) 75.14.14.14

(iv) 111100.1110.111.001

(e) What is a DNS Server ? Differentiate between Primary and Secondary DNS Servers. 10

(f) Differentiate between POP and IMAP. 5

2. Draw the header of TCP and UDP. Compare the header fields of TCP and UDP. Explain the purpose of fields which are similar between TCP and UDP. 20

3. (a) Why is remote administration needed ? Explain. 5

(b) Explain the different components of a *Passwd* file in Unix/Linux. 5

(c) Discuss the various Disk Management functions in Windows. Write the step-by-step procedure to open disk management option. 10

4. Write an algorithm (using socket programming system calls) each for UDP client and UDP server, as per the following specifications : 20

(a) UDP client will initiate the communication and send any alphanumeric character to the server.

(b) UDP server accepts that character and as a reply sends the ASCII value of that character to the client.

Note : *Make suitable assumptions, if any.*

5. Write short notes on the following : 20

(a) FTP

(b) Byte Ordering

(c) Gateways

(d) Distance Vector Routing

No. of Printed Pages : 3

BCS-052

BACHELOR OF COMPUTER APPLICATIONS (BCA) (Revised)

07475

Term-End Examination

December, 2016

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 hours *Maximum Marks : 100*

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

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1. (a) Write the limitations of classful addressing in IPv4. Also explain how these are improved by classless addressing. *5*

(b) What are ICMP messages ? Give the significance of ICMP messages. *5*

(c) What is the purpose of sequence number in a TCP segment ? Why is padding required for a TCP segment ? *5*

(d) Explain the structure of UDP datagram using a suitable diagram. *5*

(e) What is Virtual Private Network ? Compare VPN and FreeNX. *5*

(f) Compare and contrast between POP and IMAP. *5*

(g) How do the layers of TCP/IP model correlate with the layers of OSI model ? Also explain the functions of OSI model which are not mapped in TCP/IP model. *10*

2. (a) Explain DNS in terms of namespace, resource record and name server. Also discuss its message format. *10*

(b) Explain the various UDP server side system calls and getsocket, setsocket functions. Also write their parameters. *10*

3. Write an algorithm each for TCP client and TCP server according to the following specifications : *20*

- TCP server can handle maximum 3 clients concurrently.
- TCP client will send a list of numbers to the server, after establishment of connection.
- TCP server will accept the list and return back to the client.
- After receiving the reverse list the client will send "Thanks" message to the server.

4. (a) Explain the methods of TCP used for avoiding network congestion. *6*

(b) Explain the working of DHCP with the activities performed between DHCP server and DHCP client. *8*

(c) Discuss the working of RARP. Also compare it with the working of ARP. *6*

5. Write short notes on the following : *4×5=20*

(a) SNMP

(b) Raw Sockets

(c) Virtual Circuit

(d) Gateways

No. of Printed Pages : 3

BCS-052

BACHELOR OF COMPUTER APPLICATIONS (BCA) (Revised)

03741 **Term-End Examination**

June, 2017

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 hours *Maximum Marks : 100*

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

1. (a) Why and how is broadcasting used in Address Resolution Protocol ? Explain. *5*

(b) Explain the differences between UDP data transfer and TCP data transfer. *6*

(c) Why is Sliding Window Protocol used in transport layer ? Explain its working using an example when window size is of 5 bits only. *8*

(d) What is HTTP ? Explain the methods used by HTTP for data transfer. *5*

(e) Discuss the FTP connection mechanism between FTP Client and FTP Server. *5*

(f) Explain, why lost acknowledgement does not necessarily force the retransmission of TCP segment. 5

(g) Which command is used to display real-time running tasks in Linux ? Explain the significance of identified command using an example. 6

2. (a) What are the different remote administration tools ? Explain two features of each. 10

(b) Draw and explain the tree-way handshaking used by TCP for connection establishment and connection termination. 10

3. (a) Explain the purpose and importance of the following header fields of TCP and IP : 10

(i) Type of Service

(ii) Protocol

(iii) Header Checksum

(iv) Sequence Number

(b) Explain the concept of IP subnetting and supernetting with an example for each. 5

(c) Differentiate between SMTP and IMAP. 5

4. Write an algorithm for a UDP client and a UDP server for each of the following specifications :

- UDP client will initiate the communication and send the "Name of machine" to the server. *10*
- The server has a list of machine names and their corresponding passwords. After receiving the name, the sever will return back the corresponding password. *10*

5. Write short notes on the following : *4×5=20*

(a) DNS

(b) Network File System (NFS)

(c) Byte Ordering

(d) Distance Vector Routing

No. of Printed Pages : 3

BCS-052

BACHELOR OF COMPUTER APPLICATIONS (BCA) (Revised)

02710 **Term-End Examination**

December, 2017

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 hours *Maximum Marks : 100*

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

1. (a) Why is CIDR needed ? Explain with the help of an example. *5*

(b) Explain the working of ARP and RARP. *5*

(c) Explain the purpose of read( ) and write( ) system calls of data transfer. *5*

(d) What is count-to-infinity problem in Distance Vector routing ? *5*

(e) What are the basic messages used in SNMP protocol ? Explain. *5*

(f) Explain the symbolic notations of Traditional File permissions. *5*

(g) What is a Socket ? Differentiate between active and passive sockets. Explain with diagram. *5*

(h) What is the purpose of Dynamic Host Configuration Protocol (DHCP) ? List activities between DHCP server and DHCP client. 5

2. (a) Explain TCP connection set-up using three-way handshake, with the help of a diagram. 10

(b) What are Primary and Secondary DNS servers ? How does the DNS server work ? Explain with the help of a diagram(s). 10

3. (a) Explain the sequence of system calls to implement TCP client and server, using an appropriate diagram. 10

(b) Define Unicasting, Broadcasting and Multicasting. 5

(c) What are the qualities of service features in Internet Protocol ? 5

4. (a) Discuss the tasks/services for which remote administration needs to be done. 10

(b) Explain the following in the context of network security : 10

(i) System Accounts

(ii) Managing Users

(iii) Managing Groups

(iv) Password Policy

5. Explain the following with the help of suitable examples/diagrams : 20

(a) ICMP Messages

(b) Use of Type of Service (TOS) and Fragment Offset in IP Header

(c) Concept of Byte Order Conversion

(d) Stateless Operation and NFS Daemons in the context of Network File System

No. of Printed Pages : 3

BCS-052

BACHELOR OF COMPUTER APPLICATIONS (BCA) (Revised)

Term-End Examination

03705

June, 2018

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 hours *Maximum Marks : 100*

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

1. (a) Explain the significance of "Type of Service" field in the header of IP datagram. *5*

(b) What is meant by flow control ? Explain any two methods used by TCP to manage flow control. *7*

(c) Why is "getservbyname()" system call used in TCP/IP programming ? Write its syntax and different parameters taken by it. *5*

(d) Explain any five disk management functions used by the network administrator. *10*

(e) Assume the following hexadecimal number as a TCP header sequence : 9

05320017 00000001 00000000 500207FF 00000000

(i) What is the source port number ?

(ii) What is the sequence number ?

(iii) What is the acknowledgement number ?

(iv) What is the length of the header ?

(v) What is the type of the segment ?

(vi) What is the window size ?

(f) Explain any four methods used by HTTP for data transfer. 4

2. (a) Explain TCP connection-establishment and connection-termination using 3-way handshaking, along with different segments used in the processes. Make a suitable diagram for each connection-establishment and connection-termination. 10

(b) What is subnetting and supernetting ? Explain each with the help of an example. Also write the advantages of supernetting and subnetting. 10

3. Write an algorithm each for TCP client and for TCP server to perform the following tasks : *20*

- TCP client establishes the connection with server.
- TCP client sends any three numbers to the server.
- TCP server responds back to the client by sending the smallest number.
- TCP server cannot handle more than four clients at a time.

Note : Make suitable assumptions, if any.

4. (a) Write the syntax of the following system calls along with the meaning of parameters used by them : *10*

(i) bind()

(ii) htons()

(iii) connect()

(iv) listen()

(v) sendto()

(b) What is Virtual Private Network (VPN) ? Write its advantages and disadvantages. Also compare VPN with Free NX. *10*

5. Write short notes on the following : *20*

(a) Link State Routing

(b) FAT16 and FAT32

(c) SNMP

(d) Cloud Computing

No. of Printed Pages : 3

BCS-052

BACHELOR OF COMPUTER APPLICATIONS (BCA) (Revised)

Term-End Examination

01973

December, 2018

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 hours *Maximum Marks : 100*

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

1. (a) Assume Class B network uses 18 out of 32 bits to define a network address. How many Class B networks are possible in that case ? Give justification for your answer. *6*

(b) How does TCP manage "out-of-order" segment problem ? Explain through illustration. *6*

(c) Why does FTP use two TCP connections ? Also briefly explain the working of FTP. *5*

(d) Explain the significance of the following header fields of IP datagram : 8

(i) HLEN

(ii) Time to Live

(iii) Identification

(iv) Flags

(e) Differentiate between POP and IMAP protocols. 5

(f) What is DNS ? Compare between primary DNS and secondary DNS. 5

(g) Describe the different security levels, implemented in SNMP. 5

2. (a) How is the "Disc User" checked in Linux ? Explain with the help of an example. 5

(b) What are the data types defined by socket interface ? Also explain the purpose of any four. 7

(c) Write any four differences between TCP/IP and OSI model. Also draw the layer diagram of each, showing the mapping of OSI and TCP/IP layers. 8

3. Write an algorithm for UDP Client and UDP Server with the following specifications : 20

- UDP Client sends any alphanumeric character randomly to the UDP Server.
- UDP Server accepts the character and returns back the ASCII value of the character to the respective client.

4. (a) What is DHCP ? Explain the working of DHCP with the activities performed between DHCP Server and DHCP Client. 10

(b) Differentiate between ARP and RARP. With the help of suitable diagram, explain the working of each ARP and RARP. 10

5. Write short notes on the following : 4×5=20

(a) ICMP

(b) Sliding Window Protocol

(c) Distance Vector Routing

(d) Virtual Private Network

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No. of Printed Pages : 4

BCS-052

BACHELOR OF COMPUTER APPLICATIONS (BCA) (REVISED)

Term-End Examination

June, 2019

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 Hours *Maximum Marks : 100*

Note : *Question No. 1 is compulsory. Attempt any three questions from the rest.*

1. (a) What is Virtual Private Network (VPN) ? What are its advantages and dis-advantages ? Also, write differences between VPN and Free NX. 10

(b) Explain the working of ARP. Write similarities and differences between ARP and RARP. 10

(c) What is SMTP ? Explain the services offered by its components. 6

(d) Draw and explain how does TCP handle the lost acknowledgement segment and the corrupted segment. 8

(e) Explain the IP address classes. Also, indicate how many bits are used to represent the network ID and host ID part for these IP classes. 6

2. (a) Explain distance vector routing with the help of an example. 10

(b) What is DHCP ? Explain the working of DHCP with the activities performed between DHCP client and DHCP server. 10

3. Write an algorithm each for TCP client and TCP server based on the following specifications : 20

(i) TCP client will send a list of 10 numbers to the TCP server.

(ii) TCP server can handle maximum 4 client at a time. TCP server will find the smallest number from the given list and return to the respective client.

4. (a) Write the step by step procedure to configure a Samba server. Assume server IP address is 192.162.0.18 and server machine name is "BCA". 10

(b) Write the differences and similarities between TCP/IP model and OSI reference models. 10

5. Write short notes on the following : 5 each

(a) Network File System (NFS)

(b) Network Monitoring Tools

(c) Cloud Computing

(d) DHCP

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No. of Printed Pages : 4

BCS-052

BACHELOR OF COMPUTER APPLICATION (BCA)

Term-End Examination

December, 2019

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 Hours *Maximum Marks : 100*

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

1. (a) Explain the purpose of system call "***getservbyname***( )" used in socket programming. Also, explain its syntax and parameters taken by it. 5

(b) Discuss the cloud computing model. What are the advantages of cloud computing ? 6

(c) Explain the methods used by HTTP for data transfer. Give an example for each method. 6

(d) How does TCP handle out-of-order segments ? Explain the procedure with a suitable diagram. 8

(e) Compare connection-oriented and connectionless services using examples for each. 5

(f) The following is TCP header in hexadecimal format : $2 \times 5 = 10$

043721A9 16A02B12 7926AB21 6209A216 00346A2B

(i) What is the sequence number ?

(ii) What is the destination port number ?

(iii) What is the source port number ?

(iv) What is the length of TCP header ?

(v) What is the acknowledgement number ?

2. (a) How is the "Disc User" checked in Linux ? Explain with the help of an example. 5

(b) What is the purpose of byte ordering in network communication ? Also, write the functions used by byte ordering. 10

(c) Differentiate between RAT 16 and FAT 32. 5

3. Write an algorithm for TCP client and server each using the following specifications : 20

- Client program will send any random number to the TCP server.

- TCP server program will return "Yes" if the given number is a prime number else return "No" to the respective client.

4. (a) How does a DNS server work ? Explain with the help of a suitable example for recursive and iterative solutions. 10

   (b) What is the significance of SNMP ? Discuss the different security levels implemented in SNMP. 10

5. Differentiate between the following : $5 \times 4 = 20$

   (a) TCP and UDP

   (b) Broadcasting and Multicasting

   (c) IPv4 and IPv6

   (d) BOOTP and DHCP

No. of Printed Pages : 4

BCS-052

BACHELOR OF COMPUTER APPLICATION (BCA) (REVISED)

Term-End Examination

June, 2020

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 Hours *Maximum Marks : 100*

Weightage : 75%

Note : *(i) Question No. 1 is compulsory.*

(ii) Answer any ***three*** *questions from the rest.*

---

1. (a) How is flow control managed in TCP ? Explain the sliding window protocol using an example. 10

(b) Explain the purpose of the following fields of TCP and IP : 10

(i) Urgent Pointer

(ii) Window Size

(iii) Sequence Number

(iv) Fragment Offset

(c) Define a socket. Write its structure. List and explain *five* different types of socket options available. 10

(d) List and discuss at least *five* commands being used in LINUX for problem diagnosis and troubleshooting. 10

2. (a) What is remote administration ? Why is it required ? Identify and narrate some of the tasks/services for which remote administration is needed. 10

(b) With the help of a neat diagram, explain the UDP architecture. 10

3. (a) In a client/server architecture, explain the characteristics of a server program and also differentiate between sequential and concurrent server programs. 10

(b) Define an Internet Control Message Protocol (ICMP). Mention whether it is connected or connectionless environment. List and explain any ***four*** commonly employed ICMP message types. 10

4. (a) What is a DNS server ? List and explain any *two* types of DNS servers. Write the step-by-step procedure to illustrate the recursive solution for a DNS server. 10

(b) Explain Network File System (NFS) briefly. Further, with reference to NFS, write short notes on the following : 10

(i) Caching

(ii) NFS Background mounting

(iii) NFS Daemons

5. Write short notes on any ***four*** of the following : 5 each

(a) Roles and responsibilities of a Network Administrator

(b) LINUX kernel management

(c) Disk security management

(d) Socket descriptor

(e) Simple Network Management Protocol (SNMP)

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BCS-052

BACHELOR OF COMPUTER APPLICATIONS (BCA)

Term-End Examination

December, 2020

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 Hours *Maximum Marks : 100*

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

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1. (a) What is the maximum capacity of datagram that can be carried by Internet protocol ? Also, explain, how IP datagrams are discarded from the network. 5

(b) The following is the TCP header in hexadecimal format : 10

04321017 01231311 00000234 62324216 00134217

(i) What is the destination port number ?

(ii) What is the sequence number ?

(iii) What is the source port number ?

(iv) What is the length of TCP header ?

(v) What is the acknowledgement number ?

(c) What is ICMP ? Explain the functions of ICMP. 5

(d) Which field of IP header is used for selecting type of service ? Explain. 5

(e) Why and how is broadcasting used in ARP ? 5

(f) Write any ***five*** disk management functions in the context of Disk Security Management. 5

(g) How the "Disk usage" is checked in Linux ? Explain with an example. 5

2. (a) Compare and contrast TCP/IP and OSI model. Also, draw the layer diagram for each model. 10

(b) What is meant by byte-ordering ? For what purpose the following socket calls are used ? Explain using an example for each : 10

(i) htons( )

(ii) htonl( )

(iii) ntohs( )

(iv) ntohl( )

3. (a) Explain the purpose of the following fields of the TCP and IP : 10

(i) Urgent Pointer

(ii) Window size

(iii) Sequence number

(iv) Fragment offset

(b) Explain the distance vector routing algorithm with an example. 10

4. (a) What is a Socket ? Explain the structure of a socket with the help of a diagram. List and explain different types of sockets. 10

   (b) What are the different remote network administration tools ? Explain the features of each. 10

5. Differentiate between the following : 5×4=20

   (a) Supernet and Subnet

   (b) Broadcasting and Multicasting

   (c) read( ) and write( ) system calls

   (d) UDP and TCP

   (e) Switches and Hubs

BCS-052

BACHELOR OF COMPUTER APPLICATIONS (BCA) (Revised)

Term-End Examination

June, 2021

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 hours *Maximum Marks : 100*

Note : *Question no.* ***1*** *is* ***compulsory.*** *Attempt any* ***three*** *questions from the rest.*

1. (a) Do port addresses at transport layer need to be unique ? Why or why not ? Why are port addresses shorter than IP addresses ? *5*

(b) What is ARP ? How does it differ from RARP and BOOTP ? Explain. *5*

(c) Which field in IP header is used for specifying maximum number of hops that a datagram can remain on network ? Explain. *5*

(d) Draw the Block diagram of DNS. Explain the purpose of various fields used in DNS message format. *5*

(e) In electronic mail, what is MIME ? Explain its purpose and functionality. *5*

(f) How is checksum in TCP header computed ? Give an example to explain it. *5*

(g) Differentiate between FAT 16 and FAT 32. *5*

(h) List the layers in TCP/IP model. Why is layering of the protocols done in TCP/IP stack ? *5*

2. (a) What is meant by Socket ? Differentiate between active and passive sockets. *5*

(b) What is the role of 'Out-of-Order' segment ? Explain how TCP handles Out-of-Order segments. *5*

(c) What are the components of IP header ? What is the significance of fragment offset in IP header ? *5*

(d) Write the syntax and uses of "useradd" command in Linux. *5*

3. (a) How is flow control managed in TCP ? Explain the sliding window protocol using an example. *10*

(b) Explain the various components of URL, using an example. *5*

(c) How many hosts are possible per subnet and how many subnets are possible, if a subnet mask 255.255.0.0 is assigned to an address of class B ? 5

4. (a) Explain the following socket system-calls along with their purpose : $4 \times 2\frac{1}{2} = 10$

(i) Bind

(ii) Connect

(iii) Listen

(iv) Accept

(b) Write an algorithm for both, i.e. TCP client and TCP server, where the connection request from the client prompts the server to send the system date and time to the client, for which the client will send an acknowledgement. 10

5. Differentiate between the following : $4 \times 5 = 20$

(a) Gateway and Bridges

(b) TCP and UDP

(c) Authentication and Authorization

(d) SOCK_STREAM() and SOCK_DGRAM()

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BACHELOR OF COMPUTER APPLICATIONS (BCA) (Revised)

Term-End Examination

December, 2021

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 hours *Maximum Marks : 100*

Note : *Question no.* ***1*** *is* ***compulsory****. Answer any* ***three*** *questions from the rest.*

1. (a) What is the need of an IP address ? In a class subnet, the IP address of one of the hosts and mask are given below :

IP address : 27.54.62.17

Mask : 255.255.200.0

Find the subnet address. *4*

(b) List all the network layer protocols. What is the need of ICMP at the network layer ? Explain the report generated by ICMP. *5*

(c) Explain the concept of recursive resolution in DNS with the help of a diagram. *5*

(d) Explain the concept of a URL (Uniform Resource Locator) with the help of an example. Also explain the meaning of its various fields. *4*

(e) How does TCP handle out of order segments ? Explain the procedure with a suitable diagram. *6*

(f) What are the three basic types of Linux user accounts ? What are their privileges ? *3*

(g) Draw a Linux file system structure and explain the use of its directories. *4*

(h) What is the Dynamic Host Configuration Protocol (DHCP) ? How does it work ? *6*

(i) Draw the IP header format. *3*

2. (a) How are sending and receiving buffers used in stream delivery service by TCP ? Explain with the help of a diagram. *6*

(b) What are the steps followed in initializing Linux system ? Discuss. *6*

(c) What are the commands available for copying files between FTP clients and servers ? Explain these commands by writing their syntax. *5*

(d) What is the need of a sequence number in a TCP segment ? *3*

3. (a) What are the two common utilities for querying name servers provided with many DNS implementations ? *4*

(b) Differentiate elementary data transfer system calls between a client and a server after connection establishment. *4*

(c) Explain the steps required in TCP connection termination with the help of a diagram. *6*

(d) Write all the steps to be followed for secure disk management. *6*

4. (a) Discuss the common services for which remote administration is used. What are its drawbacks ? *6*

(b) What are the reasons for occurrences of networking problems in the system ? What are its drawbacks ? *6*

(c) Draw a TCP protocol stack and discuss features of any two application layer protocols. *6*

(d) Explain the purpose of the following IP address : *2*

255.255.255.255

5. (a) Write an algorithm for a UDP client and a UDP server as per the following specifications : *10*

(i) A client program sends a list of numbers to the server.

(ii) The UDP server accepts the list of numbers. As a reply, it sends the multiplication of the numbers to the client.

(b) What is the significance of the following utilities ? *6*

(i) Nslookup

(ii) Netstat

(c) What are the differences between active and passive sockets ? *4*

BCS-052

BACHELOR OF COMPUTER APPLICATIONS
(BCA) (Revised)
Term-End Examination
June, 2022

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 hours *Maximum Marks : 100*

Note : *Question no.* ***1*** *is* ***compulsory****. Answer any* ***three*** *questions from the rest.*

1. (a) Find the number of bytes required for Netid for the following address classes : *2*

(i) Class A

(ii) Class B

(b) Find the error in the following IP addresses : *3*

(i) 100.015.15.15

(ii) 01010011.35.75.80

(iii) 150.18.18.18.15

(c) Differentiate between link state and distance vector routing protocols. *6*

(d) Why do QoS parameters need to be defined in the network operations ? Explain any two such parameters. *6*

(e) List the services provided by TCP. Explain the operation of stream delivery service. *6*

(f) What are the similarities between file and socket I/O ? *3*

(g) For what purpose is listen( ) system call used in context of socket programming ? Write its syntax also. *4*

(h) Where is password file stored ? Describe its components. *4*

(j) What are the following Linux commands used for ? *6*

(i) ps-aef

(ii) ls-of

(iii) netstat

2. (a) What does the socket header file contain ? Why is it included in application programs ? Define features of any two header files. *6*

(b) Why do we need to provide security in the network system ? Discuss any four network security service parameters. *6*

(c) Explain the purpose of the following TCP header formats : *8*

(i) Source port number

(ii) Sequence number

(iii) Acknowledgment number

(iv) Checksum

3. (a) How does TCP manage lost acknowledgement and out-of-order segments ? Explain it with the help of diagrams. *6*

(b) What are the issues related to the configuration of network settings ? Elaborate. *4*

(c) Draw the structure of a socket and discuss any two types of sockets. *6*

(d) Discuss the importance and use of a proxy server. *4*

4. (a) Write a concurrent server and a client program in C language which uses TCP. The program should address the following specifications : *10*

(i) The client program sends the string to the server.

(ii) The server program reverses the string and sends the result to the client program.

(iii) The server program can manage a maximum of 5 clients concurrently.

(b) What is the use of Network File System (NFS) ? Explain the concept of hard and soft mounts in the context of NFS. *6*

(c) What is the need of a pop server in transfer of an email ? Explain with the help of a diagram. *4*

5. (a) Explain the concepts of recursive and iterative resolutions in DNS with the help of diagrams. *6*

(b) What tasks are performed in disk management ? List the steps to be followed in secure disk management. *6*

(c) Explain the concept of IP subnet addressing and subnet masking through an example. *6*

(d) What is byte ordering ? *2*

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BACHELOR OF COMPUTER APPLICATIONS (BCA) (REVISED)

Term-End Examination

December, 2022

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 Hours *Maximum Marks : 100*

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

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1. (a) Given the IP address as 111.65.17.22, find the network address. 3

(b) Identify the class of the following IP addresses : 2

(i) 22.100.150.200

(ii) 150.100.100.200

(c) Differentiate between getsocket( ) and setsocket( ) system calls. 2

(d) How are the following socket types useful in socket programming ? 6

(i) Stream socket

(ii) Datagram socket

(e) What is the primary function of a web server ? Explain the importance of Apache and Samba web servers. 6

(f) With the help of a diagram, explain 3-way handshaking technique to establish a TCP connection. 6

(g) For what purpose FTP is used ? Describe the FTP commands for copying files to or from remote host. 4

(h) What are the two ways to close a socket ? What is the difference between the two ? 5

(i) What is the use of BIND ? Describe its components. 6

2. (a) A DNS client is looking for IP address of XXX.YYY.com. Show the complete procedure for mapping a domain name to IP address. 6

(b) What are the common services for which remote administration is used ? Describe

the following utilities for secure data communication :

(i) SSH

(ii) rlog in 8

(c) Discuss the importance of the following flags of TCP header : 6

(i) Urgent pointer

(ii) Push

(iii) Acknowledgement

3. (a) What is the use of the following Ethernet configuration tools ? 5

(i) IPconfig

(ii) routelnetstat-rn

(iii) lsmod

(iv) ping.IP-address

(v) dhclient

(b) Write a concurrent TCP server and a TCP client program using C-language having the following specifications : 10

(i) The server program can handle upto four clients concurrently.

(ii) The client program sends values X = 5 and Y = 9 of two variables.

(iii) The server program swaps the value of the variables and returns the result of the respective clients.

(c) Draw the UDP header format and explain the purpose of the following fields : 5

(i) Source Port No.

(ii) Checksum

4. (a) How does the distance vector routing algorithm work ? Explain. 6

(b) What are reasons for occurrence of networking problem ? Describe the following network troubleshooting tools : 8

(i) Wmap

(ii) Traceroute

(iii) Netstat

(c) Write the syntax and explain the use of the following system calls : 6

(i) send( )

(ii) sendto( )

(iii) recvfrom( )

5. (a) Define Integrity in the context of network security. 2

(b) What information do we obtain from the following functions ? How are they useful in socket programming ? 8

(i) gethostbyname( )

(ii) gethostaddress( )

(iii) getsockname( )

(iv) getservbyname( )

(c) Write an algorithm for UDP client and UDP server as per the following specifications : 10

(i) UDP client will send a number to the server.

(ii) The UDP server will return the factorial of that number.

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BACHELOR OF COMPUTER APPLICATIONS (BCA) (REVISED)

Term-End Examination

June, 2023

BCS-052 : NETWORK PROGRAMMING AND ADMINISTRATION

Time : 3 Hours *Maximum Marks : 100*

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

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1. (a) What is a default mask ? How is it different from a subnet mask ? 3

   (b) An IP address of one of the hosts and the mask in a class B subnet are given below :3

   IP address : 130 . 154 . 121 . 33

   Mask : 255 . 255 . 200 . 0

   What is the subnet address ?

(c) Explain the following concepts in context of the NFS (Network File System) : 6

(i) Vitual file system

(ii) NFS background mounting

(d) Why do you need user management ? Explain. 4

(e) How are routing tables created and updated in distance vector routing protocol ? Explain. 4

(f) How is incompatibility problem solved at software level for setting up a computer network. 3

(g) Draw the structure of a socket descriptor and describe its fields. 6

(h) For what purpose is getsockname ( ) used in socket programming. 2

(i) How does DNS server work ? 5

(j) How do computers belonging to different networks exchange message ? Explain with the help of a diagram. 4

2. (a) What are the similarities between file and socket I/O ? 3

(b) Show the components of SNMP diagrammatically. What are the tasks performed by agent and managed components ? Why SNMP is considered to be robust and simple ? Explain. 7

(c) (I) Explain the following terms : 6

(i) Authentication

(ii) Confidentiality

(iii) Non-repudiation

(II) Briefly explain how password policy is implemented in Linux ? 4

3. (a) What are the important tasks performed at internet and transport layers ? 8

(b) What are the outputs of the following address conversion functions ? 6

(i) inet ( )

(ii) inet_addr ( )

(iii) inet-ntoa ( )

(c) How does user management work ? Discuss. 6

4. (a) How does remote log-in process work in Telent ? Explain with the help of a diagram. How is the local log-in different from the remote log-in ? 8

(b) (i) What command is used in Linux to check how much hard drive space is available ? What information is displayed as an output by running this command ? 3

(ii) What command is used in Linux to find out CPU utilization ? In what form the output is displayed by running this command ? 3

(c) What is the kernel initialization process ? What tasks are performed during the initialization process ? Elaborate on init ( ) process. 6

5. (a) Write on UDP client UDP server program in C language in Linux/Unix environment as per the following specifications : 10

(i) The UDP client sends five integer numbers to the server.

(ii) The server program sends the average of five numbers to the client

(b) Identify the classes of the following IP addresses : 2

(i) 230.15.20.30

(ii) 130.30.20.25

(c) Draw the IP reader format and explain the significance of the following fields : 8

(i) TTL

(ii) Flags

(iii) Header Length