NAPIER UNIVERSITY

SCHOOL OF COMPUTING

SECOND DIET EXAMINATION

SESSION 2001-2002

MODULE: CO32006

COMPUTER NETWORKS AND DISTRIBUTED SYSTEMS

DATE: **DURATION: 2 HOURS**

START TIME:

EXAMINER(S)

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QUESTION PAPER DATA

Number of pages - 10
Number of questions - 40
Number of sections - THREE

INSTRUCTION TO CANDIDATES

Please enter your matriculation number at the bottom of each page, and submit this examination paper with your answer book.

SECTION A: The following questions are multiple-choice, and you will loose marks for the incorrect answer. Please select answers for each of the questions, and enter it into the box provided. For example:

Q What is two plus two: [1]

(A) 1
(B) 2
(C) 3
(D) 4

D

1 Which of the following is the correct order of the OSI model: [1]

(A) Physical, data, network, session, transport, application, presentation
(B) Physical, network, data, transport, session, presentation, application
(C) Physical, network, data, transport, presentation, application, presentation
(D) Physical, data, network, transport, session, presentation, application
(E) Physical, data, network, transport, presentation, session, application

D

2 Which of the following best defines data encapsulation: [1]

(A) Splitting data into segments, so that they can be transmitted over the network
(B) Segmenting data into a number of data packets
(C) Encrypting data so that it can only be read by the destination user
(D) Adding additional information that the data can be viewed properly
(E) Wrapping the data in a particular protocol header

E

3 Which is the best definition of a MAC address: [1]

(A) An address which uses a standardized network layer address for every device or port that connects onto a network
(B) A 32-bit address that defines the location of the network and the host
(C) A physical address which uses a standardized data link layer address for every device or port that connects onto a network
(D) A logical name that is assigned by a name server
(E) A randomly assigned connection address

C

4 What method would be used to change the IP address of a computer: [1]

(A) Move the computer to another network
(B) Change the NIC
(C) Change the bridge
(D) Change the operating system
(E) Change the router

A

5 Which of the following is the main disadvantage of a bus network: [1]

(A) Nodes can only transmit data once they have a token
(B) Nodes cannot sense the other nodes on the local network
(C) That the network is reliant on a central server
(D) All nodes contend for the network
(E) A break in the ring stops data from being transmitted

D

6 If a bridge detects that a destination address in a data frame is on the same network segment as the source: [1]

(A) It passes the data frames between two network segments
(B) It forwards the data frame to all other network segments
(C) It stores the data frame for future transmission
(D) It does not forward the data frame to other network segments
(E) It forwards the data frame to the nearest router

D

7 Which of the following describes a broadcast storm: [1]

(A) The area bounded by a network segment
(B) Where nodes connected to the Internet broadcast too much data
(C) Data frames sent to all the nodes on a network segment
(D) An event where many broadcasts are sent simultaneously across the entire network.
(E) The area that defines the maximum propagation distance for a broadcast

D

8 How are IP datagrams deleted from the network: [1]

(A) They are deleted when the Time-to-live field becomes zero
(B) They are never deleted, and will always be delivered
(C) They are buffered on intermediate systems, and then deleted after a given time
(D) They have a timer attached to them
(E) They are returned to the originator if they are not deleted, and the originator either resends them or deletes them

A

9 Which of the following is a Class A IP address: [1]

(A) 12.1.14.12
(B) 146.176.151.130
(C) 194.50.100.1
(D) 255.255.255.0
(E) 224.50.50.1

A

10 What are Class D IP addresses used for: [1]

(A) Dynamic IP addressing
(B) Testing networks
(C) Static IP addressing
(D) Multicasting
(E) Domain names

D

11 What is the main difference between UDP and TCP: [1]

(A) UDP does not use IP, but TCP does
(B) TCP uses sequence numbers, makes connections and uses acknowledgements
(C) They use different addressing schemes
(D) They use different port allocations
(E) UDP only supports one-way traffic, while TCP supports multiplexed traffic

B

12 Which of the following would test the TCP layer: [1]

(A) tracert
(B) ping
(C) nslookup
(D) Connection to the echo port
(E) ipconfig /all

D

13 In the Visual Basic WinSock, which method is used by the server to wait for a connection: [1]

(A) listen
(B) wait
(C) connect
(D) accept
(E) host

A

14 In the Visual Basic WinSock, what is DataArrival: [1]

(A) A property of the WinSock object
(B) An event of the WinSock object
(C) A method of the WinSock object
(D) A class of the WinSock object
(E) A data type of the WinSock object

B

15 Which is the following is an example of a response to a client connecting into an FTP server port after the USER fred command: [1]

(A) 220 ftp-server FTP server ready
(B) 230 User fred logged in
(C) 500 'USER': command not understood.
(D) 331 Password required for fred
(E) 215 UNIX Type: L8 Version: SUNOS

D

16 In the Visual Basic WinSock, what is LocalIP: [1]

(A) A property of the WinSock control
(B) An event of the WinSock control
(C) A method of the WinSock control
(D) A class of the WinSock control
(E) A data type of the WinSock control

A

17 With WWW page integration, which of the following are always true with client-side and server-side includes (select one or more): [1]

(A) The WWW server processes client-side includes, while the WWW browser processes server-side includes
(B) The WWW browser processes client-side includes, while the WWW server processes server-side includes
(C) In client-side includes, the WWW server converts the client-side include into HTML
(D) In server-side includes, the WWW browser converts the server-side include into HTML
(E) In server-side includes, the WWW client converts the server-side include into HTML

B

18 Which of the following binary IP address is a Class B address: [1]

(A) 1100 0000 0100 1010 0100 0000 0100 1010
(B) 1000 0000 0100 1010 0100 0000 0100 1010
(C) 0100 0000 0100 1010 0100 0000 0100 1010
(D) 0010 0000 0100 1010 0100 0000 0100 1010
(E) 1110 0000 0100 1010 0100 0000 0100 1010

B

19 Which of the following might be the response from a connection to port 80 of a server after a unsuccessful GET command has been issued: [1]

(A) WWW connected
(B) HTTP/1.1 404 Object Not Found
(C) FILE NOT FOUND
(D) SENDING FILE
(E) HTTP/1.1 400 File Found

E

20 If a user can access a WWW site with its IP address, but not with its domain name, what is the likely problem: [1]

(A) The WWW site is not responding
(B) The TCP/IP protocol is not working properly
(C) The DNS server is not operating correctly
(D) The wrong TCP port is being used
(E) The session layer protocol is incorrect

C

SECTION B: The following questions are fixed-format answers. Please insert your answer in the box provided. Note you will not lose any marks if you have the incorrect answer, and that you may gain marks if you are almost correct.

21 Identify one WinSock method which would be used in a client program, and not in a server program. Also identify a WinSock property that would be set on a client program, and not in a server program: [2]

Examples include: Connect, RemoteHost

22 If a network has Class B IP addresses with 18 subnets, what will the subnet mask be: [2]

255.255.224.0 [*for full marks, give 1 mark for a reasonable answer*]

23 If a network has Class C IP addresses with 4 subnets, what will the subnet mask be: [2]

255.255.255.248 [*for full marks, give 1 mark for a reasonable answer*]

24 If a network has Class B IP addresses of the form 151.176.*y*.*z* and has 6 subnets. What is the first network address: [1]

151.176.32.0

25 If nodes connect to a network which has been allocated the address of 130.10.*y*.*z* and use a subnet mask of 255.255.240.0. What will be the first allocatable address for a host on the forth subnet: [3]

130.10.64.1 [*for full marks, give half marks for a reasonable answer*]

26 If nodes connect to a network which has been allocated the address of 130.10.*y*.*z* and use a subnet mask of 255.255.240.0. What will be the last allocatable address for a host on the forth subnet: [3]

130.10.79.254 [*for full marks, give half marks for a reasonable answer*]

27 For the PHP script given next, determine the line which contains a syntax error, and identify it: [1]

```
Line (A)        <?php
Line (B)        $value=0; //our variable
Line (C)        while($value<=10){
Line (D)                print(" $value = ".($value*$value));
Line (E)                print("<br>\n");
Line (F)                value=value+1;
Line (G)        }
Line (H)        ?>
```

F

28 For the XML file given below, determine the lines which contains a syntax error: [2]

```
Line (A)        <?xml version="1.0" encoding="iso-8859-1"?><!DOCTYPE questions>
Line (B)        <questions>
Line (C)        <no_questions>15</no_questions>
Line (D)        <subject>Introduction to Computing</subject>
Line (E)        <quest id="000001">
Line (F)        <title>How many bits are in a nibble:</title>
Line (G)        <q1>4
Line (H)        <q2>8
Line (I)        <q3>16
Line (J)        <q4>32
Line (K)        <q5>Answer a5
Line (L)        <correct>q1</correct>
Line (M)        <level>1</level>
Line (Y)        </questions>
```

Accept any of G, H, I, J and K

29 For the PHP code given next, determine an outline of the output: [2]

```
$i=0;
do
{
     $x=$i*$i;
     print "[$i $x] ";
     $i++;
} while ($i<11);
```

[0 0] [1 1] [2 4] [10 100]

[*give 1 mark for a reasonable answer*]

The following questions relate to the diagram given in Figure 1. There are four computers on two Ethernet networks (Dev-A, Dev-B, Dev-F and Dev-G), which are interconnected using two bridges (Dev-C and Dev-E) and one router (Dev-D). The ports on the bridge and the router are identified by either a 1 or a 2.

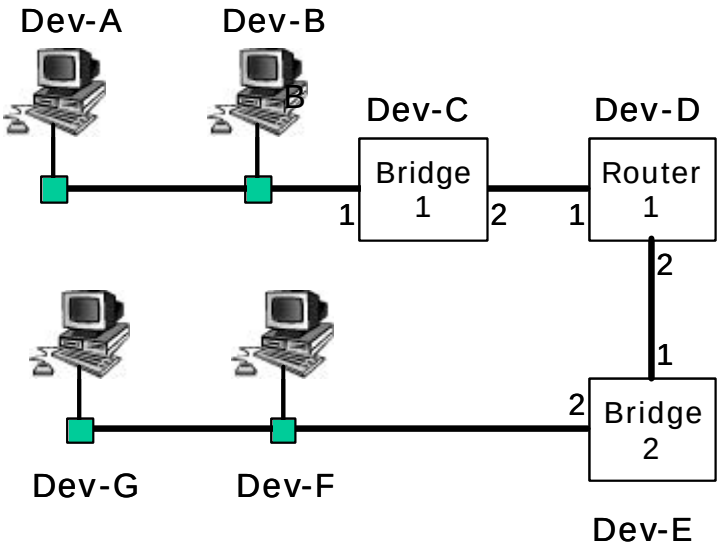

Figure 1: Two interconnected Ethernet networks

30 What is the minimum number of IP addresses which are required to be assigned for devices on each of the two Ethernet networks to intercommunicate, and explain why it is this number: [3]

6 [*give half marks for a reasonable answer*]

31 If Dev-A is communicating with Dev-G, what destination IP address will be used in the data packet which is transmitted between Dev-D (Router 1) and Dev-E (Bridge 2): [1]

(A) IP address of Dev-A
(B) IP address of Dev-B
(C) IP address of Dev-F
(D) IP address of Dev-G
(E) IP address of Dev-C, Port 1
(F) IP address of Dev-C, Port 2
(G) IP address of Dev-D, Port 1
(H) IP address of Dev-D, Port 2
(I) IP address of Dev-E, Port 1
(J) IP address of Dev-E, Port 2

D

32 If Dev-A is communicating with Dev-G, what source IP address will be used in the data packet which is transmitted between Dev-D (Router 1) and Dev-E (Bridge 2): [1]

(A) IP address of Dev-A
(B) IP address of Dev-B
(C) IP address of Dev-F
(D) IP address of Dev-G
(E) IP address of Dev-C, Port 1
(F) IP address of Dev-C, Port 2
(G) IP address of Dev-D, Port 1
(H) IP address of Dev-D, Port 2
(I) IP address of Dev-E, Port 1
(J) IP address of Dev-E, Port 2

A

33 If Dev-A is communicating with Dev-G, what MAC address will be used in the data frame which is transmitted between Dev-D (Router 1) and Dev-E (Bridge 2): [2]

(A)	MAC address of Dev-A	(B)	MAC address of Dev-B
(C)	MAC address of Dev-F	(D)	MAC address of Dev-G
(E)	MAC address of Dev-C, Port 1	(F)	MAC address of Dev-C, Port 2
(G)	MAC address of Dev-D, Port 1	(H)	MAC address of Dev-D, Port 2
(I)	MAC address of Dev-E, Port 1	(J)	MAC address of Dev-E, Port 2

H or I

34 For Dev-A, where is the end of its collision domain: [2]

(A)	Dev-A	(B)	Dev-B
(C)	Dev-F	(D)	Dev-G
(E)	Dev-C, Port 1	(F)	Dev-C, Port 2
(G)	Dev-D, Port 1	(H)	Dev-D, Port 2
(I)	Dev-E, Port 1	(J)	Dev-E, Port 2

E

35 For Dev-A, where is the end of its broadcast domain: [2]

(A)	Dev-A	(B)	Dev-B
(C)	Dev-F	(D)	Dev-G
(E)	Dev-C, Port 1	(F)	Dev-C, Port 2
(G)	Dev-D, Port 1	(H)	Dev-D, Port 2
(I)	Dev-E, Port 1	(J)	Dev-E, Port 2

G

36 If Dev-A is communicating with Dev-G what MAC address does it initially use to send a data frame: [2]

(A)	MAC address of Dev-A	(B)	MAC address of Dev-B
(C)	MAC address of Dev-F	(D)	MAC address of Dev-G
(E)	MAC address of Dev-C, Port 1	(F)	MAC address of Dev-C, Port 2
(G)	MAC address of Dev-D, Port 1	(H)	MAC address of Dev-D, Port 2
(I)	MAC address of Dev-E, Port 1	(J)	MAC address of Dev-E, Port 2

G or A

37 If Dev-A is communicating with Dev-G what destination IP address does it initially use to send a data packet: [1]

(A)	IP address of Dev-A	(B)	IP address of Dev-B
(C)	IP address of Dev-F	(D)	IP address of Dev-G
(E)	IP address of Dev-C, Port 1	(F)	IP address of Dev-C, Port 2
(G)	IP address of Dev-D, Port 1	(H)	IP address of Dev-D, Port 2
(I)	MAC address of Dev-E, Port 1	(J)	MAC address of Dev-E, Port 2

D

38 How many subnets can be created on a Class C network which uses a subnet mask of 255.255.255.224, and how many hosts can connect to **each** subnet: [2]

30 [*give half marks for a reasonable answer*]

SECTION C: The following questions are essay type questions, and should be completed in your answer book.

39 Describe two methods which make TCP vulnerable to attack. [3]

Examples are:

- Session high jacking.
- Sequence number prediction.

Marks should be assigned at the discretion of the marker.

40 How does an ATM setup a connection, and how does ATM manage to provide a given Quality of Service. Contrast this with an Ethernet network. [12]

General discussion on ATM, highlighting connection setup, virtual paths, and ATM switches.
Ethernet weaknesses should also be highlighted.
Modes of QoS should be identified.

Marks should be assigned at the discretion of the marker.

WHEN YOU HAVE COMLETED THIS EXAM, PLEASE ATTACH THIS BOOKLET TO YOUR ANSWER BOOK.