UTHM
Universiti Tun Hussein Onn Malaysia

UNIVERSITI TUN HUSSEIN ONN MALAYSIA

FINAL EXAMINATION
SEMESTER II
SESSION 2013/2014

COURSE NAME	:	COMPUTER NETWORKS
COURSE CODE	:	BIC 21303
PROGRAMME	:	2 BIS / 2 BIP /1 BIW / 1 BIM
EXAMINATION DATE	:	JUNE 2014
DURATION	:	2 HOURS AND 30 MINUTES
INSTRUCTION	:	ANSWER **ALL** QUESTIONS

THIS QUESTION PAPER CONSISTS OF **SEVEN (7)** PAGES

SECTION A

Q1   When a DHCP server is configured, compare which **TWO(2)** IP addresses should never be assignable to hosts?

```
  i.    network or subnetwork IP address
 ii.    broadcast address on the network
iii.    IP address leased to the LAN
 iv.    IP address used by the interfaces
  v.    manually assigned address to the clients
```

   (A)   i and ii
   (B)   ii and iii
   (C)   iii and iv
   (D)   iv and v

Q2   Compare which of the following statements best describes communication between two devices on a LAN?

   (A)   The source device encapsulates data in a frame with the MAC address of the destination devices and then transmits it. Everyone on the LAN sees it but the devices with non-matching addresses otherwise ignore the frame.
   (B)   The source encapsulates the data and places a destination MAC address in the frame. It puts the frame on the LAN, where only the device with the matching address can check the address field.
   (C)   The destination device encapsulates data in a frame with the MAC address of the source device. It puts the frame on the LAN, the device with the matching address remove the frame.
   (D)   Each device on the LAN receives the frame and passes it up to the computer, where software decides whether to keep or to discard the frame.

Q3   When you mail a registered package through the standard mail system, you make an assumption that the person to whom it is addressed receives it. To which protocol this is corresponding?

   (A)   UDP
   (B)   TCP
   (C)   IPX
   (D)   IP

Q4 Which of the following best describes window size?

(A) The maximum size of the window that software can have and still process data rapidly.

(B) The number of messages or bytes that can be transmitted before stopping and awaiting an acknowledgment.

(C) The size of the window in picas that must be set ahead of time so that data can be sent.

(D) The size of the window opening on a monitor, which is not always equal to the monitor size.

Q5 You are working in a data center environment and are assigned the address range 10.188.31.0/23. You are asked to develop an IP addressing plan to allow the maximum number of subnets with as many as 30 hosts each. Differentiate which IP address range meets these requirements?

(A) 10.188.31.0/27
(B) 10.188.31.0/26
(C) 10.188.31.0/29
(D) 10.188.31.0/28

Q6 Given an IP address 172.16.28.252 with a subnet mask of 255.255.240.0, compare which is the correct network address.

(A) 172.16.16.0
(B) 172.16.24.0
(C) 172.16.0.0
(D) 172.16.28.0

Q7 Which of the following is a basic service of the transport layer?

(A) Provides reliability by using sequence numbers and acknowledgments
(B) Segments upper-layer application data
(C) Establishes end-to-end operations
(D) All of the above

Q8 The presentation layer of OSI model deals with _____.

(A) routing algorithms
(B) manages data format information
(C) token management
(D) All of the above

Q9 Which function of Layer 6 protects data during transmission?

(A) Data formatting
(B) Data compression
(C) Data encryption
(D) Data protection

Q10 The client side of the client-server relationship is _____.

(A) Located in the remote computer
(B) Guest; anonymous
(C) The requestor of services
(D) Always located on the server

(10 marks)

SECTION B

Q11 Differentiate the functions of the following topologies and give **TWO (2)** examples of each:

(a) Physical

(2 marks)

(b) Logical

(2 marks)

Q12 Calculate the maximum number of hosts in the following class network.

(a) Class A

(2 marks)

(b) Class B

(2 marks)

(c) Class C

(2 marks)

Q13   Analyze usable hosts for the following classless interdomain routing (CIDR) address.

   (a)   192.125.61.8/20

(3 marks)

   (b)   10.9.5.23/14

(3 marks)

Q14   Analyze the following if Class B network using a subnet mask of 255.255.248.0.

   (a)   Number of borrowed bits.

(2 marks)

   (b)   Number of possible subnets.

(2 marks)

   (c)   Number of usable subnets.

(2 marks)

   (d)   Number of possible hosts per subnet.

(2 marks)

   (e)   Number of usable hosts per subnet

(2 marks)

Q15   A router has received a packet for host 130.5.2.144 (8 bits borrowed for subnetting). Analyze to which subnet this packet will be routed.

(3 marks)

Q16   There are 310 hosts to be on the same network. As an administrator, you have been asked to outline a subnet mask that has least amount of wasted addresses. Provide detail of your work to get the suitable subnet mask.

(3 marks)

Q17   The network administrator needs to address seven LANs. Analyze the maximum number of usable IP addresses that can be supported on each LAN if the organization is using one class C address block?

(3 marks)

Q18   Analyze the following requirement of the two sub-networks below:

```
Sub-network 1 - 84 hosts. One of the IP addresses is 172.16.1.126
Sub-network 2 - 114 hosts. One of the IP addresses is 172.16.1.129
```

(a)   State the subnet mask in use.

(4 marks)

(b)   Calculate the range of IP addresses for each sub-network.

(4 marks)

Q19   Maximum horizontal cable length of 10Base-T network is 100 m (actual 99 m). Outline the maximum distances for horizontal cabling based on TIA/EIA-568-A standard.

(6 marks)

Q20   Identify the Layer 1 device that includes in the NIC in many technologies.

(2 marks)

Q21   Solve the following given information as in CRC generator and CRC checker.

```
Data : 100100
Divisor : 1101
```

(8 marks)

Q22   The network administrator has asked you to check the status of the workstation's IP stack. State the full ping command that you should execute perform this task?

(2 marks)

Q23   What do TCP and UDP use to keep track of different conversations crossing a network at the same time?

(1 mark)

Q24   Identify the following:

(a)   Purpose of the first six hexadecimal numbers in MAC address.

(1 mark)

(b)   Layer that control dialogue and token management.

(1 mark)

(c)   Function of Layer 6 that protects data during transmission.

(1 mark)

(d)   Any two protocols of Layer 5.

(2 marks)

Q25 Given:

```
Bit stream : 1111

Number of redundancy bits (r): 2^r >= m + r + 1 (where m is the number of
data bit).
```

Answer the following questions and provide detail of your work.

(a)   Calculate the value for r.

(2 marks)

(b)   Determine the position of all the redundancy bits.

(6 marks)

(c)   Calculate the values of these redundancy bits.

(3 marks)

(d)   Calculate the final Hamming Code.

(2 marks)

-END OF QUESTION-