Mansoura University		Department: Computers Engineering And Control Systems 1st year	Faculty of Engineering

Course Title: Introduction to computer Network
Date: June, , 2014 (Second term)

Course Code: CSE 3125
Allowed time: 3 hrs

Total Marks: 100 Marks
No. of Pages: (2)

Remarks: (Answer the following questions… assume any missing data)
Read the rest of the exam before going with the solution, Trust yourself and prove that your are worthy qualified for engineering title

Question No. (1) 4 points each   (32 Marks)

Q1-A) Computer network can be categorized based on set of characteristics; state 5 of these Characteristics, then give some examples?

Q1-B) what is transmission media? Then state; Different media considerations, and what is Microwave?

Q1-C) What is Network Server and Network Services, Then state five major network services? Finally state what is a client?

Q1-D) Match the following protocols and their functions
(a) http, (b) pop, (c) ftp, (d) smtp, (e) MIME,
1. Send email messages
2. Transfer multimedia information
3. Send email attachment
4. Transfer files in servers and clients computers
5. Receive email messages

Q1-E) "As you know within the data computer network each node may have N types of addresses," Specify them then state the maximum and minimum number of each one.

Q1-F) State the suitable Link(s) which may be used to share the data stored on your cell phone (mobile) within a (LAN or WAN), Then List the most recent trends that are contributing to the future shape of complex information networks

Q1-G) List the different ways for increasing the speed of the LAN systems, Then Discuss the effect of such increasing on an LAN Network which used the following access methods (CSMA/CD, CSMA/CA , Time slot, token passing)

Q1-H) Suppose that you had to design a 100 Mbps CSMA/CD protocol in which the maximum one-way propagation delay between any two hosts is 10 0 Micro S. What will you use as the minimum size of a transmitted frame if you wish the transmitting node to detect a collision before completing the transmission of the frame?

Question No. (2)   3 point each (26 Marks)

Q2-A) Which of the following Net types can be implemented as (i) Star (ii) Bus
      (i) LAN (ii) Man (iii)WAN

Q2-B) Which of the following Net types can be implemented as Server based (and why)
      (i)Star   (ii) Bus   (iii) tree

Q2-C) What is the difference between a hub, a bridge, a switch, and a router?

Q2-D) What are the main differences between connectionless networks and connection- oriented networks?

Q2-E) An image is 1024 x 768 pixels with 3 bytes/pixel. Assume the image is uncompressed. How long does it take to transmit it over a 56-kbps modem channel? Over a 1-Mbps cable modem? Over a 10-Mbps Ethernet? Over 100-Mbps Ethernet?

Q2-F) True or False (and why) TCP is a connection oriented protocol. This means that a virtual circuit is created to assure that all messages associated with a particular connection take the same path through the Internet.

Q2-G) What are the important fields in the TCP, UDP, and IP headers? Without these fields, the protocols would clearly not "work".

Q2-H) Write a short Note about the following Network terms (IPv6 –Mobile_IP- Network Security, VPN, IPSec - Quality of Service – VoIP – Wireless – Web_based application - Encryption Decryption – Streaming) **[5 points]**

Question No. (3) 4 points each (32 Marks)

Q3-A) What is the subnet for the host IP address 172.16.210.0/22?

Q3- B) List the different types of networks based on the data link layer

Q3-C) You have a main office and 3 branches. Each branch has 2 floors. Each floor has a cable length requirement up to 150 meters. Each branch is 20 miles away from main office. Your job is to link the main office and 3 branches together. There are two proposal

(I) LANs can talk to each other within a branch

(II) LANs can talk to the main office.

For Each solution specify

(i) The most suitable shared channel , and required devices within each branch and between branches

(ii) Draw the physical structure of the generated network in each case and give it a suitable name

Q3-D) What is the key disadvantage of a physically direct-wired LAN? Explain how a star-wired LAN remedies this disadvantage.

Q3-E) What are the three parameters that are needed by a host to operate on an IP network (besides DNS server IP)?

Q3-F) A TCP Receiver sends an ACK number of 4870 and a Window of 1000. It receives 200 more bytes in two new segments without being able to upload any bytes to the receiving application. What ACK number does it now send? What Window number does it now send?

Q3-G) Explain why a doubling of the speed of the systems which based on CSMA/CD may result in decreased network performance. What changes could be made to ameliorate the problem?

Q3-H) List the different way to prevent the collision in full-duplex link?

Question No. (4)   4 points each (32 Marks)

Q4-A) A layer 2 device is a device that understand ----------,[Fill in the space]; then give three example?

Q4-B) Give one reason why a telecommunications company might choose to send data using microwave transmission?

Q4-C) An organization has a class C network 200.1.1 and wants to form subnets for four departments there are 145 hosts in all as follows:

A	72 hosts
B	35 hosts
C	20 hosts
D	18 hosts

1. Give a possible arrangements of the subnet masks to make this possible.

2. Suggest what the organization might do if the department D grows to 34 hosts.

Q4-D) Explain why CSMA/CD does not work for shared wireless networks

Q2-E) Find the relation between (Communication schema, LAN Access method, and shared channel access control) **Then List some most useful advantages and disadvantages of Token Ring.**

Q4-F) When the traffic load on the LAN is very light, which MAC protocol has a smaller delay: Ethernet or token ring? Explain your answer briefly.

Q4-G) List the different access methods for WAN, for each specify the advantages and disadvantages?

(Q4-H) With simplex transmission, problems encountered during the transmission can be detected and corrected. State the internetworking technologies support such type of transmission and Explain how?

(Q4-I) Describe the mechanisms in TCP that manage the interrelationship between window size, data loss and congestion during a session?

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I hope that everyone did well   **Best wishes**   Prof. Dr Hesham Arafat