



## Final Examination Cover Sheet

First Semester: 1436 / 1437 - 2015 / 2016

Course Title:	<u>Computer Networks</u>	Course Code:	<u>IT 210</u>
Exam Duration:	<u>2 Hours</u>	Number of Pages: (including cover page)	<u>11</u>

The table below is to be filled by the student

Student Name:	_____	Student ID:	_____
Class Day & Time	_____	CRN:	_____
Instructor Name:	_____	Exam Date:	_____

### Exam Guidelines

- Mobile phones are not permitted.

### Marking Scheme

Questions	Score
Q1 10	/
QII 7.5	/
QIII 7.5	/
QIV 15	/
Q V 10	/
<b>Total Score 50</b>	<b>/ 50</b>

Q I: MCQ

MARKS [20X0.5=10]

1. \_\_\_\_\_ cable consists of an inner copper core and a second conductor outer sheath.

- a) Twisted-pair
- b) Coaxial**
- c) Fiber-optic
- d) Shielded twisted pair

2. The infrared wave has frequencies \_\_\_\_\_ microwave.

- a) below
- b) above**
- c) the same as
- d) none

3. For twisted pair cables, which of the following value of “Diameter” will result in lowest attenuation?

- a) .023
- b) .015
- c) .040**
- d) .020

4. In which topology every device has a dedicated point-to-point link to every other device?

- a) Star topology
- b) Mesh Topology**
- c) Bus topology
- d) Ring topology

5. Currently \_\_\_\_\_ is responsible for the management of internet domain names and addresses.

- a) NIC
- b) ICANN**
- c) ISOC
- d) IEFE

6. If an Ethernet destination address is 02:01:02:03:04:05, then this is a \_\_\_\_\_ address

- a) Unicast**
- b) Broadcast
- c) Multicast
- d) None of the above

7. Consider a noiseless channel with a bandwidth of 3000 Hz transmitting a signal with two signal levels. The maximum bit rate will be:

- a) 300 bps
- b) 3000 bps
- c) 600 bps
- d) **None of the above**

8. STP normally consists of:

- a) Metal shield and metal cover
- b) Plastic cover and plastic shield
- c) **Metal shield and plastic cover**
- d) None of the above

9. The vulnerable time for a pure ALOHA is \_\_\_\_\_ the one for slotted ALOHA.

- a) Less than
- b) **Greater than**
- c) Equal to
- d) None of the above

10. Generally, an 18 Gauge UTP cable has \_\_\_\_\_ diameter than a 26 gauge UTP cable:

- a) Smaller
- b) **Larger**
- c) Equal
- d) small or large (both are possible)

11 Looping problems in a set of switches can be eliminated using \_\_\_\_\_ algorithm.

- a) Routing
- b) Forwarding
- c) **Spanning-tree**
- d) None of the above

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12. CSMA is based on the principle

- a) **listen before talk**
- b) transmit when polled
- c) wait for the reservation slot
- d) transmit using the assigned frequency

13. Bluetooth is a \_\_\_\_\_ technology that connect devices in a small area

- a) Wired LAN
- b) VLAN
- c) **Wireless LAN**
- d) None of the above

14 A link layer switch is a connecting device that operates in the \_\_\_\_\_ layer(s).

- a) Physical, data-link and network
- b) Data-link and network
- c) Physical
- d) **Physical and data-link**

15. Distribution coordination function(DCF) uses ----- as the access method in IEEE 802.11.

- a) **CSMA/CA**
- b) ALOHA
- c) CSMA/CD
- d) All of the above

16. The performance of a network can be measured by measuring

- a) Delay
- b) Throughput
- c) Packet loss
- d) **all of the above**

17. Which of the following is a unicast routing algorithm?

- a) RIP
- b) OSPF
- c) BGP
- d) **all of the above**

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18. The OSPF routing algorithm is based on \_\_\_\_\_ algorithm

- a) distance-vector
- b) link-state**
- c) path-vector
- d) link-path-state

19. TELNET is an abbreviation for \_\_\_\_\_.

- a) Terminal network**
- b) Telephone network
- c) Telecommunication network
- d) None of the choice are correct

20. DNS can use the services of \_\_\_\_\_.

- a) UDP
- b) TCP
- c) Either UDP or TCP**
- d) None of the choice are correct

[PTO]

**Q II Fill in the Blanks** **MARKS** [15X0.5=7.5]

(Transport) (Digital) (Wireless) (Network)  
 (Forwarding) (IEEE 802.11) (IEEE 803.11) (piconet)  
 (Hops) (FSK) (ACL) (Broadcast) (Critical Angle)  
 (Wireless Networks) (Physical- layer) (Unicast) (Frame)  
 (Multicast) (Application) (BNC)

1. UDP and TCP are two protocols at the \_\_\_\_\_ layer. (**Transport**)
2. In unicast routing, a packet is routed, hop by hop, from its source to its destination by the help of \_\_\_\_\_ tables. ( **forwarding**)
3. ARP is a/an \_\_\_\_\_-layer protocol. (**network**)
4. IEEE has defined the specifications for a wireless LAN, called \_\_\_\_\_, which covers the physical and DLL. (**IEEE 802.11**)
5. In RIP, the cost is defined as the number of \_\_\_\_\_.( **hops**)
6. Bluetooth defines two types of networks one is \_\_\_\_\_and the other is Scatternet. (piconet)
7. The IEEE 802.11 FHSS uses \_\_\_\_\_modulation. (**FSK**)
8. In Bluetooth, the \_\_\_\_\_ link is used when data integrity is more important than avoiding latency. (**ACL**)
9. In Ethernet addressing, if all the bits are 1s, the address is\_\_\_\_\_. (**Broadcast**)
10. For a ray of light to be reflected in Fiber-Optic cable, the value  $I$  should be greater than the \_\_\_\_\_. (**Critical Angle**)

11. CSMA/CA is a preferable method for \_\_\_\_\_. (**Wireless Networks**)
12. SSH is a(n) \_\_\_\_\_ layer protocol. (**Application**)
13. An ARP reply is normally \_\_\_\_\_. (**unicast**)
14. A packet at the data-link layer is normally called a \_\_\_\_\_. (**frame**)
15. \_\_\_\_\_ is a type of connectors used in coaxial cabling. (**BNC**)

**Q. III TRUE and FALSE**

**MARKS [15X0.5= 7.5]**

1	Infrared operates at a higher frequency than microwaves.	<b>True</b>
2	A socket address is a combination of a MAC address and a logical address	<b>False</b>
3	Congestion control refers to the mechanism and techniques to keep the load below the capacity	<b>True</b>
4	IPv4 is a connection-oriented protocol.	<b>False</b>
5	Router is involved in three layers of TCP/IP protocol suite.	<b>True</b>
6	The main problem to be solved in providing mobile communication using the IP protocol is addressing.	<b>True</b>
7	A VLAN is a local area network configured by software.	<b>True</b>
8	A repeater has no filtering capability.	<b>True</b>
9	A router is a connecting device that operates in the network layer.	<b>False</b>
10	Bluetooth is a wireless LAN technology that connects devices in small areas.	<b>True</b>
11	Fast Ethernet has a data rate of 100 Mbps.	<b>True</b>

12	Vulnerable time for Slotted ALOHA is double than pure ALOHA.	<b>False</b>
13	Transmission media belongs to layer '0' of OSI-TCP/IP model	<b>True</b>
14	In CSMA protocols, the vulnerable time is equal to queuing time.	<b>False</b>
15	UTP and STP are different implementations of twisted-pair cable.	<b>True</b>

**Q. IV Short Questions.**

**MARKS [5X3=15]**

1. Differentiate the term Periodic and Nonperiodic signal.

**Answer:**

A periodic signal completes a pattern within a measurable time frame, called a period, and repeats that pattern over subsequent identical periods. The completion of one full pattern is called a cycle. A nonperiodic signal changes without exhibiting a pattern or cycle that repeats over time. Both analog and digital signals.

2. Differentiate between FDMA and TDMA

**Answer:**

FDMA: Bandwidth is divided and shared in frequency bands. Bandpass filter is used to confine the frequencies.

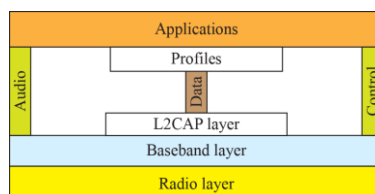
TDMA: Bandwidth is divided and shared in Time Slots. Each station transmits in allocated time slot.



3. Describe Bluetooth with architecture.

**Answer:**

Bluetooth is a wireless LAN technology designed to connect devices of different functions when they are at a short distance from each other. A Bluetooth LAN is an ad hoc network. The devices, sometimes called gadgets, find each other and make a network called a piconet. Bluetooth defines two types of networks: piconet and scatternet. Bluetooth uses several layers that do not exactly match those of the Internet model.



4. Explain Stop-and-Wait protocol.

**Answer:**

Our second protocol is a connection-oriented protocol called the Stop-and-Wait protocol, which uses both flow and error control. Both the sender and the receiver use a sliding window of size 23. The sender sends one packet at a time and waits for an acknowledgment before sending the next one. To detect corrupted packets, we need to add a checksum to each data packet. When a packet arrives at the receiver site, it is checked. If its checksum is incorrect, the packet is corrupted and silently discarded.

5. Explain Secure Shell (SSH).

**Answer:**

Although Secure Shell (SSH) is a secure application program that can be used today for several purposes such as remote logging and file transfer, it was originally designed to replace TELNET. There are two versions of SSH. The first version, SSH-1, is now deprecated because of security flaws in it. The second version, SSH-2.

**Q. V Long Question.**

**MARKS [2X5=10]**

1. (a) The following is the contents of a UDP header in hexadecimal format.

**CB84000D001C001C**

**Give the following answer:**

- a. What is the source port number?
- b. What is the destination port number?
- c. What is the total length of the user datagram?
- d. What is the length of the data?
- e. Is the packet directed from a client to a server or vice a versa?

**Answer:**

- a. The source port number is the first four hexadecimal digits  $(CB84)_{16}$  or 52100
- b. The destination port number is the second four hexadecimal digits  $(000D)_{16}$  or 13.
- c. The third four hexadecimal digits  $(001C)_{16}$  define the length of the whole UDP packet as 28 bytes.
- d. The length of the data is the length of the whole packet minus the length of the header, or  $28 - 8 = 20$  bytes.
- e. Since the destination port number is 13, the packet is from the client to the server.

**OR**

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**1 (b) Discuss about the IEEE 802.11 with architecture and MAC sublayer.**

**Answer:**

IEEE has defined the specifications for a wireless LAN, called IEEE 802.11, which covers the physical and data-link layers. It is sometimes called wireless Ethernet. In some countries, including the United States, the public uses the term WiFi (short for wireless fidelity) as a synonym for wireless LAN.

WiFi, however, is a wireless LAN that is certified by the WiFi Alliance. The standard defines two kinds of services: the basic service set (BSS) and the extended service set (ESS).

IEEE 802.11 defines two MAC sublayers: the distributed coordination function (DCF) and point coordination function (PCF).

**2 Explain the terms**

- a) Packet loss
- b) Throughput

**Answer:**

- a) Packet loss: An issue that severely affects the performance of communication is the number of packets lost during transmission. When a router receives a packet while processing another packet, the received packet needs to be stored in the input buffer waiting for its turn. A router, however, has an input buffer with a limited size. A time may come when the buffer is full and the next packet needs to be dropped. The effect of packet loss on the Internet network layer is that the packet needs to be resent, which in turn may create overflow and cause more packet loss.
- b) Throughput at any point in a network is defined as the number of bits passing through the point in a second, which is actually the transmission rate of data at that point. In a path from source to destination, a packet may pass through several links (networks), each with a different transmission rate.

[GOOD LUCK]