



MASENO UNIVERSITY

UNIVERSITY EXAMINATIONS 2016/2017

**FIRST YEAR SECOND SEMESTER EXAMINATIONS FOR THE
DEGREE OF BACHELOR OF SCIENCE IN INFORMATION AND
COMMUNICATIONS TECHNOLOGY MANAGEMENT**

MAIN CAMPUS

CIT 116/CIM 106: DATA COMMUNICATIONS

Date: 8th June, 2017

Time: 12.00 - 3.00 pm

INSTRUCTIONS:

- Answer ALL questions in SECTION A and any other TWO from SECTION B
- Write your registration number on all sheets of the answer book used.
- Use a NEW PAGE FOR EVERY QUESTION attempted, and indicate number on the space provided on the page of the answer sheet.
- Fasten together all loose answer sheets used.
- Mobile phones and PDAs are NOT allowed in the examination room.



SECTION A
ANSWER ALL QUESTIONS IN THIS SECTION
EACH QUESTION CARRIES ONE MARK UNLESS INDICATED OTHERWISE

1. What is the OSI model?

 - A. A conceptual framework that specified how information travel through networks
 - B. A model that describes how data makes its way from one application program to another throughout a network
 - C. A conceptual framework that specifies which network occur at each layer
 - D. All of above

2. With regard to Ethernet media access methods, which of the following are true? (Choose two that apply) (2 Marks)

 - A. A device waits for an electronic signal before transmitting.
 - B. A device listens and waits until the media is not busy before transmitting.
 - C. All devices on an Ethernet segment see data that passes on the network medium.
 - D. Only the sender and the receiver devices see data that passes on the network medium.
 - E. Ethernet networks allow you to configured devises with higher transmission priority.

3. Synchronous Time Division multiplexing will not allocate a time slot to a source that is idle.

 - A. true
 - B. false

4. Which of the following is not a guided transmission line ?
[A] Twisted pair [B] Coaxial cable [C] Optical fiber [D] Laser beam

5. The loss of power a signal suffers as it travels from the transmitting computer to a receiving computer is: A) Echo B) Jitter C) Spiking D) Attenuation

6. Which OSI layer is responsible for logical addressing?
A. Data link B. Physical C. Transport D. Network

7. Coaxial cables are widely used on
[A] telephone networks [B] cable TV networks [C] broadband networks [D] none of these above

8. The effective bandwidth of a signal is the
[A] Width of the spectrum [B] width of range of frequencies
[C] Band of frequencies containing most of the energy in the signal [D] width of the channel

9. Twisting of wire reduces
[A] interference [B] impulse noise [C] low frequency interference [D] none of these above

10. Which of the following transmission is concerned with content of the data ?

 - [A] Analog transmission [B] Digital transmission
 - [C] Both analog and digital transmission [D] None of these above

11. Communication between a computer and a keyboard involves _____ transmission.
[A] simplex [B] half-duplex [C] full-duplex [D] automatic

12. _____ defines how a particular pattern to be interpreted, and what action is to be taken based on that interpretation.

- [A]Semantics [B]Syntax [C]Timing [D]None of the above
13. _____ refers to two characteristics: when data should be sent and how fast it can be sent.
 [A]Semantics [B] Syntax [C] Timing [D] none of the above
14. A video consists of a sequence of
 [A] Frames [B] Signals [C] Packets [D] Slots
15. Which best describes a CSMA/CD network?
 A. One node transmission traverses the entire network and is received and examined by every node.
 B. Signals are sent directly to the destination if the source knows both the max and ip addresses
 C. One node transmission goes to the nearest router, which sends it directly to the destination
 D. Signals are always sent in broadcast mode
16. Which data communication method is used to transmit the data over a serial communication link?
 [A] Simplex [B] Half-duplex [C] Full duplex [D] All of above
17. protocols are?
 [A] Agreements on how communication components and DTE's are to communicate
 [B] Logical communication channels for transferring data
 [C] Physical communication channels sued for transferring data
 [D] None of above
18. Loss in signal power as light travels down the fiber is called?
 [A] Attenuation [B] Propagation [C] Scattering [D] Interruption
19. Which best describes broadcasting?
 A. Sending a single frame to many stations at the same time
 B. Sending a single frame to all routers to simultaneously update their routing tables
 C. Sending a single frame to all routers at the same time
 D. Sending a single frame to all hubs and bridges at the same time
20. Which of the following devices takes data sent from one network device and forwards it to all devices on the network regardless of the intended recipient?
 [A] DNS Server [B] Switch [C] Hub [D] Gateway
21. HUB is a _____ Device and Switch is a _____ Device.
 [A] Unicast, Multicast [B] Malticast, Unicast [C] Broadcast, Unicast [D] None of Above
22. Star Topology is Based On a Central Device that can be _____ ?
 [A] HUB [B] Switch [C] Only A [D] Both A and B
23. In an optical fiber, the inner core is _____ the cladding.
 [A] denser than [B] less dense than [C] the same density as [D] another name for
24. _____ can be achieved by using multiplexing; _____ can be achieved by using spreading.
 [A] Efficiency; privacy and antijamming [B] Privacy and antijamming; efficiency
 [C] Privacy and efficiency; antijamming [D] Efficiency and antijamming; privacy

25. _____ is a digital multiplexing technique for combining several low-rate channels into one high-rate one.
 [A] FDM [B] TDM [C] WDM [D] None of the above
26. _____ is designed to be used in wireless applications in which stations must be able to share the medium without interception by an eavesdropper and without being subject to jamming from a malicious intruder.
 [A] Spread spectrum [B] Multiplexing [C] Modulation [D] None of the above.
27. Which error detection method consists of just one redundant bit per data unit?
 [A] Simple parity check [B] Two-dimensional parity check
 [C] CRC [D] Checksum
28. The _____ between two words is the number of differences between corresponding bits.
 [A] Hamming code [B] Hamming distance [C] Hamming rule [D] none of the above
29. Block coding can help in _____ at the receiver.
 [A] Synchronization [B] Error detection [C] Attenuation [D] (a) and (b)

SECTION B
ANSWER ANY TWO QUESTIONS IN THIS SECTION
QUESTION 2

- a) TCP and UDP are well-known data transport protocols provided by the Internet Transport Layer. Provide a brief description of each service and indicate what type of application might use that service. (4 marks)
- b) Define the main differences between the TCP and UDP protocols. (4 Marks)
- c) Explain the CSMA/CD mechanism used in standard Ethernet. How does frame bursting help in collision detection in Gigabit Ethernet? (6 marks)
- d) Compare persistent and non-persistent medium access control methods. Also explain how collision detection is combined with each of these methods. (6 Marks)

QUESTION 3

- a) Name four (4) types of multiplexing giving a brief explanation of each. (8 Marks)
- b) Compare circuit switching and packet switching (5 Marks)
- c) Differentiate asynchronous and synchronous data transmission. (4 Marks)

QUESTION 4

- a) Write short notes on the three most significant impairments experienced during data transmission (6Marks)
- b) Describe the physical construction characteristics of the following transmission media. If there is more than one type of each media then present the choices of type and identify the differences between them
- Twisted pair (2 marks)
 - Coaxial cable (2 marks)
 - Optical fiber cable (2 marks)
- c) Possible choices for data communication infrastructure for long distance data transfer include **microwave optical fiber** and **radio transmission**. Discuss the advantages and disadvantages of each of these media in terms of cost political impact ease of installation and adaptability in providing a range of services to clients (8 marks)

QUESTION 5

- a) Write down some disadvantages of star topology. (5 Marks)
- b) Comment on the current status of IPv4 in this context. Identify the major emerging problems for IPv4 and discuss how they are addressed in IPv6 (5 Marks)
- c) Write down the characteristics of Sine Wave. (5 Marks)