FACULTY OF MANAGEMENT AND ADMINISTRATION

CIS 303 NETWORKS AND COMMUNICATION

Date:	**November 2014**
Time:	**3 hours**

Instructions to candidates:

- This paper consists of **six (6)** questions.
- **Answer all** questions in **section A**.
- **Answer any three** questions in **section B**.
- Where part marks are allocated to subsections of a question, the marks are enclosed in brackets [].
- Start each question on a fresh page

SECTION A: ANSWER ALL QUESTIONS

Question 1

a) Define the following terms :
   (i)   Bandwidth
   (ii)   Baud   **[3*2]**
b) Describe two methods of Media Access control   **[6]**
c) It is often said that the Internet offers a ***best effort quality of service***. Explain what you understand from the term.   **[7]**

Question 2

a) Network equipment types can be classified as ***Data Terminal Equipment (DTE), Data Circuit Equipment (DCE)*** and ***Data Switching Equipment (DSE***) .Explain each of the above.   **[6]**
b) Explain how available bandwidth and the signal to noise ratio for a particular transmission medium affects the maximum transmission speed.   **[5]**
c) What is packet switching? How does it differ from circuit switching?   **[4]**
d) A salesman has been given a company laptop computer. They are currently attending a conference in another country but need to access their company's network and servers. Explain how; if they have access to the Internet, they could use a VPN to gain secure access their company's network. You may   assume that the company network is also connected to the Internet via a Firewall.   **[6]**

SECTION B: ANSWER ANY THREE (3) QUESTIONS

Question 3

a) Outline the basic operation of the *Open Shortest Path (OSPF)* routing protocol.   **[10]**

b) Why is it important for routers to know about all of the possible routes through a network topology?   **[4]**

c) Show, by means of a diagram, how a subnet mask can be used to extract the network identification and host identification from an IP address   **[6]**

Question 4

a) Describe the three(3) types of digital to analogue Modulation   **[15]**

b) Show, by means of a diagram, the frame format used within the IEEE 802.3 CSMA/CD LAN   **[5]**

Question 5

Error detection and correction is an important issue when we are moving information across network links.
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a) Briefly describe the technique known as single bit parity checking. Include is your answer an explanation of what is meant by even parity and odd parity.   **[5]**

b) Describe what is meant by longitudinal parity and transverse parity and how both can be used together as an error correction technique under some circumstances.   **[5]**

c) In many circumstances, parity checking is inadequate and other techniques have to be used. Produce an outline of the technique known as Frame Check Sequence (FCS) or Cyclic Redundancy Check (CRC).   **[6]**

d) Identify the circumstances when the use of Frame Check Sequence (FCS) would be more suitable than parity checking.   **[4]**

Question 6

a) State at which layer of the OSI model the following devices operate on:
   i)   Router
   ii)   Hub
   iii)   Switch   **[2*3]**
b) As a protocol data unit (PDU) passes in the TCP/IP layers from the application layer to the network access layer its name changes to reflect its new functions. State the PDU name for each TCP/IP layer.   **[8]**
c) Explain the hidden Station Problem.   **[6]**

THE   END