MAASAI MARA UNIVERSITY

REGULAR UNIVERSITY EXAMINATIONS
2017/2018 ACADEMIC YEAR
SCHOOL OF SCIENCE AND INFORMATION SCIENCES

THIRD YEAR FIRST SEMESTER EXAMINATIONS FOR THE BACHELOR OF SCIENCE IN COMPUTER SCIENCE

COURSE CODE: COM 317
COURSE TITLE: DATA COMMUNICATION & COMPUTER NETWORKS

DATE: 18-04-2018   **TIME: 11:00AM-13:00PM**

INSTRUCTIONS TO CANDIDATES
- ANSWER Question **ONE** and any other **TWO**

This paper consists of 3 printed pages. Please turn over.

QUESTION ONE (30 MARKS)

a.) Explain the use of following terms in relation to data networks.
  i. Segmentation
  ii. Exponential Backoff
  iii. Host
  iv. Fast ethernet
  v. Bandwidth

[5 Marks]

b.) You are tasked by the county government to set up a network covering five of its wards. Using a clear diagram, discuss the mechanisms that will enable wards have a communication system.

[7 Marks]

c.) Explain **THREE** fundamental characteristics on which the effectiveness of data communication depends on.

[6 Marks]

d.) Fiber optic cable serves as one of the networking medium. Explain the purpose of cladding in optical fiber and discuss its density relative to the core.

[4 Marks]

e.) i) Define the term protocol and explain the composition of an Internet Protocol in data communication.

[3 Marks]

   ii) Resolve the following IP address to its decimal equivalent, identify its class, its subnet and state where its suitable for use.

1 0 1 1 0 0 1 1 0 0 0 0 0 1 0 0 1 0 1 0 1 0 0 0 0 0 0 0 0 1

[5 Marks]

QUESTION TWO (20 MARKS)

a.) To overcome the challenges of the previous model, the ring network allowed data to flow in only one direction, either 'clockwise' or 'anticlockwise'. Discuss this notion and describe this architecture in reference to the 802.5 IEEE.

[8 Marks]

b.) "*Flow control is a set of procedures used to restrict the amount of data that the sender can send before waiting for an acknowledgement.*" Qualify this statement

[12 Marks]

QUESTION THREE (20 MARKS)

a. The following message is to be transmitted from sender to receiver: $M_{(X)} = X^9 + X^8 + X^5 + X$; suppose that the agreed divisor polynomial between the sender and receiver is $X^5 + X^4 + 1$, find out the actual message transmitted using CRC.

[12 marks]

b. What if three left most bit of the message are inverted due to noise on the transmission link, determine the result of the receivers CRC, and explain how the receiver is able is able to detect that an error has occurred.

[8 marks]

QUESTION FOUR (20 MARKS)

a.) You are tasked to design and install two – four hundred computer laboratories connected to 12Mbps using STP cables of 1000m each. With propagation speed similar to that of the speed of light, and frame sizes of 800 bits, calculate propagation delay, transmission delay and the effective throughput of such a network.

[10 marks]

b.) The mobile switching centre of GSM architecture are four major registers. By use of a diagram, expound this architecture and briefly describe the functions of each register.   **[10 marks]**

END//