



# MACHAKOS UNIVERSITY

University Examinations for 2018/2019

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

SIT 113: NETWORKING

DATE: 8/5/2019

TIME: 8.30-10.30 AM

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## INSTRUCTIONS

Answer **question ONE** and any other **TWO** questions.

### QUESTION ONE (30 MARKS)

- a) Define the following terms as used in computer networks:
  - i. Bandwidth
  - ii. Bottleneck (2 marks)
- b) Describe the arrangement of wires on:
  - i. A straight through cable (4 marks)
  - ii. A crossover cable (4 marks)
- c) Describe the encapsulation and de-capsulation process with the aid of a well labelled diagram. (5 marks)
- d) Distinguish between a network logical topology from the physical topology. (2 marks)
- e) Using a well labelled diagram, describe the components of a frame format. (4 marks)
- f)
  - i Convert the following IP Address 172.168.1.7, to its equivalent binary form. (2 marks)
  - ii Explain the class to which the IP Address in f)i) belongs (1 mark)
  - iii Explain the key fields of the IP Address in f)i) (2 marks)
- g) Differentiate between the following terms:
  - i Packet switching vs. circuit switching. (2 marks)

- ii Peer to peer network vs. client server network. (2 marks)

### QUESTION TWO (20 MARKS)

- a) Discuss the following protocols (8 marks)
- i. NAT
  - ii. DHCP
  - iii. TCP
  - iv. UDP
- b) Explain four threats to the Machakos University network. Explain **four** counter-measures to the threats. (4 marks)
- c) With the aid of well labelled diagrams, distinguish between the following LAN technologies - Token ring and FDDI. (6 marks)
- d) Describe attenuation and how it can be managed in a network. (2 marks)

### QUESTION THREE (20 MARKS)

- a) As a network designer you will most likely use the following devices to enhance the performance of your network. Highlight the scenarios where you are likely to use the following devices bringing out clearly the differences between the operations of each.
- i. Switch
  - ii. Router
  - iii. Gateway
  - iv. Bridge (8 marks)
- b) i State **five** factors that influence the choice of a network topology (5 marks)
- ii With the aid of a well labelled diagram, explain the difference between an Active Topology and a Passive Topology. (4 marks)
- c) Describe the **three** classes of IP addresses (3 marks)

### QUESTION FOUR (20 MARKS)

- a) Differentiate between the following
- i. Parallel transmission and Serial transmission
  - ii. Modulation and Demodulation (8 marks)
- b) With the aid of a well labelled diagram, explain the operation of a hub-based network topology (3 marks)

- c) List the **three** types of unbounded data transfer technologies (3 marks)
- d) Describe the **three** methods of transmission of frames within a local network. (6 marks)

**QUESTION FIVE (20 MARKS)**

- a) State **two** factors to put into consideration in selecting Cable type to be used in implementing a network (2 marks)
- b) Show diagrammatically and explain the **two** layers that specify IEEE 802 standards (4 marks)
- c) With the aid of diagrams, explain the following transmissions
  - i. Asynchronous and Synchronous (4 marks)
  - ii. Full Duplex and Half Duplex (4 marks)
- d) Explain **three** types of Access Methods in networking (6 marks)