



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 (COMPUTER SCIENCE)

SCO 105: DATA COMMUNICATION TECHNOLOGIES

DATE: 8/5/2019

TIME: 8.30-10.30 AM

INSTRUCTIONS

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

QUESTION ONE (30 MARKS)

- a) Distinguish Baseband and Broadband technologies in data communication (2 marks)
- b) State THREE fundamental characteristics on which the effectiveness of data communication depends (3 marks)
- c) Distinguish Asynchronous Transmission from Synchronous transmission as modes of Data transmission (3 marks)
- d) Explain FIVE components of data communication. (5 marks)
- e) Define a protocol and explain key components of a protocol (3 marks)
- f) Explain any two types of Collision Domains in Ethernets. (4 marks)
- g) Explain the following Switching techniques. (6 marks)
 - i. Circuit switching
 - ii. Packet switching
 - iii. Message switching
- h) Explain how Virtual Circuit Switched Communications Work (4 marks)

QUESTION TWO (20 MARKS)

- a) Using a well labeled diagram, explain OSI model and responsibilities of each layer.
(14 marks)
- b) State any THREE levels of addresses used in an internet employing the TCP/IP protocols
(3 marks)
- c) Distinguish Transmission time from propagation time as used in Flow Control protocols
(3 marks)

QUESTION THREE (20 MARKS)

- a) Define the following terms as used with Data communications
(6 marks)
 - i. Delay
 - ii. Jitter
 - iii. Bandwidth
 - iv. Throughput
 - v. Half Duplex mode
 - vi. Full Duplex mode
- b) Explain three services offered by the datalink layer
(6 marks)
- c) Explain four advantages of IPV6 over IPV4
(4 marks)
- d) Name the advantages of fiber optic cable over twisted pair and coaxial cable
(4 marks)

QUESTION FOUR (20 MARKS)

- a) Describe any FIVE routing protocols
(10 marks)
- b) Explain the functions of the following networking components and devices
(10 marks)
 - i. Hub
 - ii. Gateways
 - iii. Routers
 - iv. Switches
 - v. Modem

QUESTION FIVE (20 MARKS)

- a) Briefly discuss the main differences between TCP (Transmission Control Protocol) and UDP (User Datagram Protocol). (8 marks)
- b) Describe the following types of cables used in networking (8 marks)
 - i. Twisted pair cable
 - ii. Coaxial cable
 - iii. Fibre optic cable
- c) Distinguish peer to peer and client – server based as means of accessing network (4 marks)