



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

FIRST YEAR SECOND SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (INFORMATION TECHNOLOGY)

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO105/SIT 170 DATA COMMUNICATIONS

DATE: 22/6/2021

TIME: 8.30-10.30 AM

INSTRUCTIONS

Answer question ONE and any other TWO questions.

QUESTION ONE (30 MARKS)

- a) By use of diagrams, explain the following types of transmission modes (9 marks)
 - i. Simplex
 - ii. Half duplex
 - iii. Full duplex
- b) Compare and contrast TCP/IP and OSI reference model (8 marks)
- c) Describe star-bus topology (5 marks)
- d) Using a well labelled diagram, explain data communication model (8 marks)

QUESTION TWO (20 MARKS)

- a) Briefly explain four types of multiplexing techniques (8 marks)
- b) Explain the function of the following (6 marks)
 - i. Network Virtual terminal
 - ii. File Transfer, Access and Management
 - iii. Directory Services
- c) Student would like to setup a network to connect his personal devices. Explain the type of network he would install (6 marks)

QUESTION THREE (20 MARKS)

- a) Explain the (8 marks)
 - i. Function of a switch
 - ii. Function of a router
 - iii. the layer for OSI model for each device in i and ii
- b) Explain three methods of switching in a switched network (8 marks)
- c) Explain ATM (4 marks)

QUESTION FOUR (20 MARKS)

- a) State any three advantages and disadvantages of fibre optic cable (6 marks)
- b) An institution uses fiber optic and satellite to provide redundancy in connectivity. Draw networking diagram, showing how this could be achieved (5 marks)
- c) Explain (9 marks)
 - i. Twisted pair cable
 - ii. Hybrid topology
 - iii. Two network performance parameters

QUESTION FIVE (20 MARKS)

- a) State the function of each layer of OSI model (7 marks)
- b) Explain the three main categories of wireless transmission (6 marks)
- c) A student noticed that there are a lot of collisions in her data communication channel. Explain how she could use token passing and CSMA to minimize the collisions (7 marks)