



MACHAKOS UNIVERSITY

University Examinations for 2020/2021 Academic Year

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR SPECIAL/SUPPLEMENTARY EXAMINATION FOR

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 300: COMPUTER NETWORKS

DATE: 25/3/2021

TIME: 2:00 – 4:00 PM

INSTRUCTIONS

This paper consists of **FIVE** questions.

Answer **question ONE** and **any other TWO** questions in this paper.

QUESTION ONE (30 MARKS)

- a) Explain the following terms: (6 marks)
- i) Baseband signal
 - ii) Broadband signal
 - iii) Bandwidth
 - iv) Bottleneck
 - v) Extranet
 - vi) OSI
- b) State three factors to put into consideration in selecting Cable type to be used in implementing a network. (3 marks)
- c) Outline five functions of network operating system. (5 marks)
- d) Show diagrammatically and explain the layers that specify IEEE 802 standards. (4 marks)
- e) Explain the factors that influence the choice of a network topology (5 marks)
- f) With the aid of well labeled diagrams describe the encapsulation and decapsulation process in network transmissions (7 marks)

QUESTION TWO (20 MARKS)

- a) What are two main classifications of networks. (4 marks)
- b) List six services that networks provide. (6 marks)
- c) Explain the difference between a router, repeater and bridge (3 marks)
- d) Describe briefly the seven layers of the OSI model. (7 marks)

QUESTION THREE (20 MARKS)

- a) Describe briefly the two types of twisted pair media. (4 marks)
- b) Explain four reasons a wireless media would be chosen over a bound media? (4 marks)
- c) What is a major benefit and a major drawback of fiber-optic cable? (2 marks)
- d) With the aid of diagrams, explain the difference between a logical and a physical topology. (4 marks)
- e) With the aid of diagrams, explain the difference between contention-based and token-passing access methods. (6 marks)

QUESTION FOUR (20 MARKS)

- a) When discussing Repeaters, Bridges, and Routers, which device relies on logical network addresses, physical hardware addresses, or does not use addresses at all? (4 marks)
- b) With the aid of diagrams, describe the difference between synchronous and asynchronous transmissions. (4 marks)
- c) Describe three protocols that are used in the TCP/IP Protocol suite. (6 marks)
- d) Describe three IP classes and their address ranges. (6 marks)

QUESTION FIVE (20 MARKS)

- a) Explain five functions of a NIC in networking (5 marks)
- b) Describe any three types of physical network topologies used in LAN. (6 marks)
- c) Distinguish between the following:
 - Radio and microwave transmission. (2 marks)
 - Half duplex and full duplex transmissions. (2 marks)
- d) Explain five ways that a network administrator can enforce security in a network. (5 marks)