



MACHAKOS

UNIVERSITY

University Examinations for 2020/2021

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF COMPUTING AND INFORMATION TECHNOLOGY

THIRD YEAR FIRST SEMESTER EXAMINATION FOR

BACHELOR OF SCIENCE (MATHEMATICS AND COMPUTER SCIENCE)

BACHELOR OF SCIENCE (COMPUTER SCIENCE)

SCO 300: COMPUTER NETWORKS

DATE: 11/8/2021

TIME: 11:00 – 1:00 PM

INSTRUCTIONS

Answer question ONE and any other Two questions

QUESTION ONE (COMPULSORY) (30 MARKS)

- a) List five components in data communication. (5 marks)
- b) When two stations are communicating, this happens using various methods. Discuss three such methods. (6 marks)
- c) You have been hired as a consultant to evaluate the network of a large organization within your locality. Explain three aspects you would consider in your evaluation criteria. (6 marks)
- d) Discuss two major types of network connections (4 marks)
- e) With clear illustrations, discuss three types of network topologies, citing where each may be applied. (9 marks)

QUESTION TWO (20 MARKS)

- a) Discuss three types of networks in application today stating clearly how they are deployed (6 marks)
- b) Internet is supporting businesses where most operations are based on applications hosted and supported by internet active devices. Take an example of email service, where the server is hosted in a different country. Illustrate how data is relayed from the mail server to your desktop computer. (6 marks)

- c) Discuss the seven layers of OSI model, indicating the unit of exchange in each of the layers. (7 marks)
- d) Differentiate between de facto and de jure communication standards. (1 mark)

QUESTION THREE (20 MARKS)

- a) Define multiplexing (1 mark)
- b) With clear illustrations, discuss three multiplexing techniques. (9 marks)
- c) Define a switched network (1 mark)
- d) Illustrate three types of switched networks with examples of their application in industry in the 21st century. (9 marks)

QUESTION FOUR (20 MARKS)

- a) Define the following terms as used in circuit switched networks.
 - i) Interleaving (1 mark)
 - ii) Jitter (1 mark)
 - iii) Connectionless communication (1 mark)
 - iv) Band width (1 mark)
- b) Compared to Datagram and circuit switched networks, virtual circuit switched networks have become prevalent and have been adopted in many organizations worldwide. Analyze five reasons which make virtual circuit switched networks more popular than the rest. (10 marks)
- c) Discuss three causes of delay in a virtual circuit switched network (6 marks)

QUESTION FIVE (20 MARKS)

- a) Discuss four error correction mechanisms in the data link layer applied to solve timing gaps between frames during frame bit streaming. (8 marks)
- b) Discuss the following concerning networking
 - i. Unrestricted Simplex Protocol (2 marks)
 - ii. Simplex Stop-and-Wait Protocol (2 marks)
 - iii. One-Bit Sliding Window Protocol (2 marks)
 - iv). Point-to-Point Protocol (2 marks)
- c) Differentiate between synchronous and asynchronous data communication citing area of application (4 marks)