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**KIRIRI WOMEN'S UNIVERSITY OF SCIENCE AND TECHNOLOGY**  
**UNIVERSITY EXAMINATION, 2023/2024 ACADEMIC YEAR**  
**FIRST YEAR, FOURTH SEMESTER EXAMINATION**  
**FOR THE DIPLOMA IN INFORMATION COMMUNICATION TECHNOLOGY**  
**DIT 1010 – DATA COMMUNICATION AND NETWORKING**

Date: 14<sup>TH</sup> APRIL 2022  
Time: 11:30AM – 1:30PM

**INSTRUCTIONS TO CANDIDATES**

**ANSWER QUESTION ONE (COMPULSORY) AND ANY OTHER TWO QUESTIONS**

**QUESTION ONE (30 MARKS)**

Kiriri University requires a Network that will cater for their administrative and student's needs. The users range from lecturers, administrative assistants and students. All types of users need to access the internet through the network. The university management also requires the network to support WIFI access. The university members of staff need to access the university management information system, which should not be accessed by the students. The total number of expected users is 500 at any given time.

- a) Which is the most appropriate network topology for this network. Give the reasons for your answer (4 Marks)
- b) What transmission impairments is the network likely to experience? explain (6 Marks)
- c) What transmission medium will be used to connect the network? Give reasons for your Answer stating types of transmission medias (6 Marks)
- d) How will this network be secured from intruders and students who might attempt to access confidential information such as examinations (6 Marks)
- e) Discuss different types of switching technique and explain which technique might be appropriate for the network. Give reasons for your answer (5 Marks)
- f) Explain any three methods that are applied for the network security (3 Marks)

**QUESTION TWO (20 MARKS)**

- a) Explain the advantages of a layered model (5 Marks)
- b) Explain the seven layers of the Open Systems Interconnection (OSI) and it's importance in networking (8 Marks)
- c) Compare and contrast the OSI model and the TCP/IP model (6 Marks)

**QUESTION THREE (20 MARKS)**

- a) Distinguish between guided and unguided transmission media; and give an example of each case (6 Marks)
- b) Discuss different types of networks, briefly explaining how the user computers will be configured to access the network (8 Marks)
- c) Discuss any functions of Network Interface Card. (6 Marks)

**QUESTION FOUR (20 MARKS)**

- a) Clearly distinguish the terms *analog* and *digital* forms of data representation and illustrate each of the data signal forms (6 Marks)
- b) Explain the Client – Server model as a configuration for the business data communication systems (6 Marks)
- c) Many organizations are adopting networking technology to aid in performing their operations. Explain any *six* benefits associated with networking (8 Marks)

**QUESTION FIVE (20 MARKS)**

- a) Explain the term multiplexing. (4 Marks)
- b) Explain the concept of time division multiplexing. (8 Marks)
- c) Which is the most appropriate multiplexing method for today's networks? Give reasons for your answer. (8 Marks)