



# TECHNICAL UNIVERSITY OF MOMBASA

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FACULTY OF ENGINEERING AND TECHNOLOGY

ELECTRICAL AND ELECTRONICS ENGINEERING DEPARTMENT

## UNIVERSITY EXAMINATION FOR:

**THIRD YEAR EXAMINATION FOR THE DIPLOMA OF SCIENCE IN  
ELECTRICAL ENGINEERING (DTIE 6)**

**ETI 2306: DATA NETWORKS**

**END OF SEMESTER EXAMINATION**

**SERIES:** DECEMBER 2016

**TIME:** 2HOURS

**DATE:** 2016/2017

### Instructions to Candidates

You should have the following for this examination

*-Answer Booklet, examination pass and student ID*

This paper consists of 5 questions. Attempt ANY THREE QUESTIONS

**Do not write on the question paper.**

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### Question One

- a) Define the X.25 equipment terminologies
  - a) DTE
  - b) DCE
  - c) DSE[6 marks]
- b) Describe how you can multiplex STS frame [4 marks]
- c) Differentiate between datagrams and virtual circuits in packet switching [4marks]
- d) Differentiate between parallel and serial transmission and state their advantages [6 marks]

### Question two

- a) Define X.25 network[2 marks]
- b) Differentiate ISDN and DSL [3 marks]
- c) Define SONET and explain the SONET frame format [6marks]
- d) State two WAN protocols [2 marks]

- e) Give three examples of circuit switched network [3 marks]
- f) Describe services provided by ISDN in communication system [4marks]

### **Question Three**

- a) Define ISDN [2 marks]
- b) Discuss the layers of the OSI Model related to X.25 networks [6 marks]
- c) Explain the channels that are used in ISDN [3 marks]
- d) List and explain the user interfaces used in ISDN networks [6 marks]
- e) Explain the functions of session layer in the OSI model [3marks]

### **Question Four**

- a) Describe the concept of packet switching in data networks [4marks]
- b) Define the following:
  - i. VPN
  - ii. DHCP
  - iii. NAT [3 marks]
- c) List and explain the layers of OSI Model [4 marks]
- d) Describe the advantages of layered OSI model approach [5marks]
- e) Differentiate between congestion control and congestion avoidance as used in frame relay networks [4 marks]

### **Question Five**

- a) List the SONET device [2 marks]
- b) Explain the characteristics of the frame relay network [4 marks]
- c) Explain broadband services used in Tele-worker services [3 marks]
- d) Explain the DHCP operation in computer networks [3 marks]
- e) Differentiate between SONET and SDH [4marks]
- f) State four advantages of circuit switching [4 marks]