TECHNICAL UNIVERSITY OF MOMBASA

Faculty of Engineering and Technology

DEPARTMENT OF ELECTRICAL AND ELECTRONIC ENGINEERING

UNIVERSITY EXAMINATION FOR:

BACHELOR OF TECHNOLOGY IN ELECTRICAL & ELECTRONIC ENGINEERING

ETI 2306 DATA NETWOKS

END OF SEMESTER EXAMINATION

SERIES: 2019

TIME: 2 HOURS

DATE: July 2019

Instructions to Candidates

You should have the following for this examination
Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions. Attempt any **THREE questions.**

Do not write on the question paper.

Question ONE

(a) Describe the main goal of the OSI model. (3 marks)

(b) Highlight any FOUR functions of the following OSI model layers:

(i) Physical (ii) Data link (iii) Network (9 marks)

(c) Using an appropriate sketch show the data format and how the data moves from the presentation layer in one computer down to the physical layer through the transmission medium and up the second computer from the physical to the presentation layer. (8 marks)

Question TWO

(a) (i) Describe any TWO operational features of a WAN

(ii) Distinguish between the following WAN virtual circuits

I Switched virtual circuits (SVC) II Permanent virtual circuits (6 marks)

(b) Describe the following WAN technologies

(i) Point-to-point (ii) Circuit switching (iii) Packet switching (6 marks)

(c) Highlight any operational features of the following WAN devices:

(i) Routers (ii) Switches (iii) CSU/DSU (iv) Communication servers

(8 marks)

Question THREE

(a) (i) Describe the main goal of ISDN.

(ii) With the aid of a sketch explain the following ISDN basic services:

I Bearer services II Teleservices III Supplementary services (10 marks)

(b) By means of sketches explain the function of the following network termination types:

(i) NT1 (ii) NT2 (iii) TE1 (iv) TE2 (v) TA (10 marks)

Question FOUR

(a) (i) Define an X.25 network

(ii) Explain the functions of the THREE layers in X.25 and their protocols (8 marks)

(b) Describe any THREE benefits of Frame Relay over X.25. (6 marks)

(c) Draw a Frame Relay network and explain how a switched virtual connection is made. (6 marks)

Question FIVE

(a) Explain any FOUR design goals that the ATM network is supposed to address. (4 marks)

(b) With reference to ATM networks describe any THREE features for each of the following:

(i) Mixed network traffic (ii) Cell networks (6 marks)

(c) Describe the functions of the following ATM layers:

(i) Application adaptation layer

(ii) ATM layer

(iii) Physical layer (6 marks)

(d) Highlight any FOUR applications of the SONET system. (4 marks)