



TECHNICAL UNIVERSITY OF MOMBASA
INSTITUTE OF COMPUTING AND INFORMATICS

Select department

UNIVERSITY EXAMINATION FOR:

BSCS/SEP2022/J-FT

BTIT/SEP2022/J-FT

BSSC/SEP2022/J-FT

BTIT/JAN2024/S-PT

CIT 4307: DATA COMMUNICATION

END OF SEMESTER EXAMINATION

SERIES: DECEMBER 2024

TIME: 2 HOURS

DATE: Pick Date Dec 2024

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 question ONE (Compulsory) and any other TWO questions.

Do not write on the question paper.

Question ONE

- (a) (i) Define a MODEM
(ii) Compare and contrast DSL MODEM to cable MODEM (6 Marks)
- (b) Describe briefly the evolution of wireless networks (4 Marks)
- (c) Given the following IP address 172.16.187.0/23 find
(i) The network IP address
(ii) 1st IP address
(iii) Last IP address (6 Marks)
- (d) Distinguish between static and public IP addresses (2 Marks)

- (e) Describe the following flow controls with the aid of a sketch
- (i) Stop and Wait
 - (ii) Go back N times
 - (iii) selective (6 Marks)
- (f) Describe error control as applied in data communication (6 Marks)
- (i) Error prevention
 - (ii) Error detection
 - (iii) Error correction

Question TWO

A data communication organization wishes to upgrade the services it has been offering to include multimedia so as to satisfy user demand, however the company is worried this move may lead to poor network performance, poor quality of services, poor security and increased cost of the network among others undesirable issues;

REQUIRED

Discuss how the organization could overcome all the following FOUR challenges

- (i) Cost of Communication (4 Marks)
- (ii) Security (6 Marks)
- (iii) Performance (5 Marks)
- (iv) Quality of Service (5 Marks)

Question THREE

(a) Describe the following IEEE 802 standards

- (i) 802.3
- (ii) 802.4
- (iii) 802.5
- (iv) 802.11
- (v) 802.16 (10 Marks)

(b) A telecommunication organization that deal with end to end data communication solutions has approached you for advice on the data switching techniques that they need to use to satisfy clients with varied needs such as Circuit Switching and Packet Switching; REQUIRED

- (i) Discuss the TWO switching techniques and state their most suitable environment (10 Marks)

Question FOUR

(a) The most important standard is Open System Interconnect OSI and TCP/IP. Other standards are IETF Internet Engineering Task Force, IEEE Institute of Electronic and Electrical Engineers

(i) Describe the reasons that led to the establishment of standards (6 Marks)

(b) Compare and contrast the structure functionality of OSI reference model to TCP/IP protocol suite

(14 Marks)

Question FIVE

(a) (i) Define carrier systems (1 Mark)

(ii) Describe how T1 carrier systems work (4 Marks)

(iii) Describe the function of SONET (5 Marks)

(iv) Describe how ISDN functions (5 Marks)

(b) (i) Define IP addressing (1 Mark)

(ii) Distinguish between DHCP and NATs (4 Marks)