



TECHNICAL UNIVERSITY OF MOMBASA

SCHOOL OF ENGINEERING AND TECHNOLOGY

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

UNIVERSITY EXAMINATION FOR:

BACHELOR OF SCIENCE IN ELECTRICAL & ELECTRONICS ENGINEERING

TEE 4513 : DATA COMMUNICATION

END OF SEMESTER EXAMINATION

SERIES: NOVEMBER 2025

TIME: 2 HOURS

DATE: NOVEMBER 2025

Instructions to Candidates

You should have the following for this examination

-Answer Booklet, examination pass and student ID

This paper consists of **FIVE** questions.

Answer question **ONE** and **ANY TWO** questions.

Do not write on the question paper.

QUESTION ONE (30 MARKS)

- (a) Describe the THREE core components of a classical network structure [6 Marks]
- (b) How do loss and delay occur in data networks [6 Marks]
- (c) Outline the TWO key advantages of layering as applied in data network architecture. [4 Marks]
- (d) Describe the functions of the various layers in the TCP/IP architecture [8 Marks]
- (e) Describe the DNS service from hostname to IPaddress [6 Marks]

QUESTION TWO (20 MARKS)

- (a) With the aid of appropriate sketches outline the overview of the HTTP protocol [8 Marks]
- (b) With the aid of appropriate sketches describe the client-server architecture [6 Marks]
- (c) With the aid of appropriate sketches outline the process of Domain name resolution [4 Marks]
- (d) Describe the process of DNS caching and updating of records. [2 Marks]

QUESTION THREE (20 MARKS)

- (a) With the aid of appropriate sketches describe in detail the process of input port queuing [8 Marks]
- (b) With the aid of appropriate sketches describe the TCP retransmission scenarios [6 Marks]
- (c) With the aid of appropriate sketches describe the TCP 3-way handshake [6 Marks]

QUESTION FOUR (20 MARKS)

- (a) With respect to the network layer describe [6 Marks]
 - (i) Data plane
 - (ii) Control plane
- (b) With the aid of appropriate sketches describe the following scheduling approaches [6 Marks]
 - (i) FIFO scheduling
 - (ii) Priority scheduling
 - (iii) Round Robin (RR) scheduling
- (c) Outline the concept of datagram service [4 Marks]
- (d) Considering a large network scenario describe the basic idea of Subnetting [4 Marks]

QUESTION FIVE (20 MARKS)

- (a) Describe the THREE components of a routing algorithm [6 Marks]

- (b) Outline the characteristics of the Routing Information Protocol (RIP) [4 Marks]
- (c) Briefly describe the characteristics of the Open Shortest Path First (OSPF) protocol [4 Mark]
- (d) Describe the following techniques used for making routing scalable [6 Marks]
- (i) Scale
 - (ii) Administrative autonomy