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TEVETA
Technical Education, Vocational and Entrepreneurship Training Authority

DIPLOMA COMPUTER STUDIES

LEVEL 6 EXAMINATIONS

FINAL INTEGRATED SUMMATIVE EXAMINATION

SITTING: NOVEMBER/DECEMBER 2023

SUBJECT: COMPUTER NETWORKS

TIME: THREE (3) HOURS **TOTAL MARKS: 100**

PASS MARK: 50

INSTRUCTIONS

1. Write your examination number and National Registration Card number on the answer Booklet provided. Ensure to append your signature in the space provided on the answer booklet.
2. Write your answer **SCRIPT SERIAL NUMBER** on the examination register provided and the entry slip.
3. There are **SEVEN (7)** questions in this paper.
4. You are required to attempt any FIVE (5) questions
5. All questions carry equal Marks.
6. Cell phones and programmable calculators are not allowed in the examination room.

DO NOT TURN THIS PAGE UNTIL YOU ARE TOLD TO DO SO

QUESTION 1

a) Describe the functions of the following networking devices:

i) Router (2 marks)

ii) Bridge (2 marks)

iii) Switch (2 marks)

iv) NIC (2 marks)

b) State **four (4)** OSI layers at which each of the devices above operates. (4 marks)

c) Explain the following functional tasks of a protocol:

i) Time out control (4 marks)

ii) Sequencing (4 marks)

Total (20 marks)

QUESTION 2

a) With the use of **two (2)** examples, distinguish between

i) Parallel and serial transmission (8 marks)

ii) Guided and unguided media (8 marks)

b) Explain the term Broadband and baseband (4 marks)

Total (20 marks)

QUESTION 3

All devices on a network follow a standardised framework of functions and protocols in order to communicate with other devices within and across networks. These standards are specified in the OSI model.

a) List **two (2)** network troubleshooting utilities (2 marks)

b) Describe **two (2)** functions of each of the first **five (5)** layers of OSI model. (15 marks)

c) Explain the term Encapsulation. (3 marks)

Total (20 marks)

QUESTION 4

a) List **four (4)** layers of the TCP/IP model in their order. (4 marks)

b) Define the terms; *open systems* and *network protocol* (4 marks)

c) Explain the functions of the following protocols

i) ICMP (3 marks)

ii) TCP (3 marks)

d) Explain the relationship between Dial up line and Public Switch Telephone Network. (6 marks)

Total (20 marks)

QUESTION 5

During a video and voice call, a connection maybe lost or interrupted. Therefore the receiver does not get the messages sent during this period, lost messages are not resent. Instead, only the messages, which are sent when both the sender and receiver have a connection, are received.

a) Using an example, explain connection oriented transmission and connectionless transmission. (12 marks)

b) Explain **two (2)** error detection techniques. (8 marks)

Total (20 marks)

QUESTION 6

The network layer uses logical addresses, known as Internet Protocol addresses to route packets across networks and identify devices.

a) State the classes of IP addresses and their corresponding range. (10 marks)

b) Describe the following types of IP addresses:

i) Host IP address (2 marks)

ii) Network IP address (2 marks)

iii) Multicast IP address (2 marks)

iv) Subnet mask (2 marks)

v) Media access used in bus topology. (2 marks)

Total (20 marks)

QUESTION 7

a) In relation to data transmission, define the following terms:

i) Noise (2 marks)

ii) Bandwidth (2 marks)

iii) Attenuation (2 marks)

b) Distinguish between ring and mesh topology. (4 marks)

c) Describe the **two (2)** types of serial transmission. (6 marks)

d) Differentiate intranet from extranet (4 marks)

Total (20 marks)