

DICT LEVEL II

COMPUTER NETWORKING

MONDAY: 21 May 2018.

Time Allowed: 3 hours.

Answer ALL questions. Marks allocated to each question are shown at the end of the question.

QUESTION ONE

- (a) Highlight four advantages of using internal modems over external modems for network interconnectivity. (4 marks)
- (b) Describe each of the following types of backbone networks:
- (i) Serial backbone network. (2 marks)
 - (ii) Collapsed backbone network. (2 marks)
 - (iii) Distributed backbone network. (2 marks)
- (c) Charles Mutua needed to set up a mesh topology with a total of 20 nodes.

Required:

Advise Charles Mutua on the number of:

- (i) Interfaces required for each node. (2 marks)
 - (ii) Links in the topology. (3 marks)
- (d) Consider the Internet Protocol (IP) address 172.168.16.8

Required:

- (i) Convert the above IP address to an octal binary number. (3 marks)
- (ii) Identify the network class to which the above IP address belongs. (2 marks)

(Total: 20 marks)

QUESTION TWO

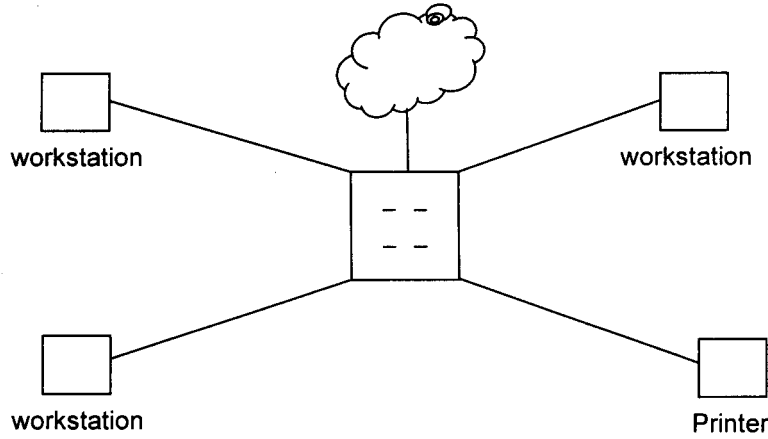
- (a) Distinguish between "local talk LAN" and "Ethernet LAN". (4 marks)
- (b) Explain two possible types of clients in a peer to peer (P2P) computer network model. (4 marks)
- (c) Describe three protocols of the internet layer of the TCP/IP model. (6 marks)
- (d) You have been requested to help in troubleshooting a malfunctioning computer network.

Enumerate six steps that you would follow in order to restore the network. (6 marks)

(Total: 20 marks)

QUESTION THREE

(a) The diagram below represents a network topology:



Required:

- (i) State the type of network topology shown in the diagram above. (1 mark)
 - (ii) Analyse three characteristics of the above network topology. (3 marks)
 - (iii) Outline two advantages of using the above network topology. (2 marks)
- (b) Most organisations are shifting from the use of copper cables to fibre optic cables in the design of computer networks. Highlight four reasons for the above trend. (4 marks)
- (c) Summarise four functions of a network operating system (NOS). (4 marks)
- (d) Evaluate three criteria that could be used to classify data communication networks. (6 marks)
- (Total: 20 marks)**

QUESTION FOUR

(a) The rapid advance in information and communication technology (ICT) has given rise to “convergent networks”.

With reference to the above statement:

- (i) Define the term “convergent network”. (2 marks)
 - (ii) Explain three benefits of a convergent network. (6 marks)
 - (iii) Evaluate three requirements of a convergent network. (6 marks)
- (b) “Network hosts that do not require access to the internet can use private addresses”.
- With reference to the above statement, break down the range of IP addresses from class A to class C. (6 marks)
- (Total: 20 marks)**

QUESTION FIVE

- (a) Illustrate how a wired computer network would integrate with a wireless computer network. (4 marks)
 - (b) Highlight four advantages and four disadvantages of a wired communication system. (8 marks)
 - (c) Citing four reasons, justify why an organisation would invest in a computer network. (4 marks)
 - (d) Enumerate the steps you would follow to configure internet connection in an Ethernet Local Area Network (LAN). (4 marks)
- (Total: 20 marks)**
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