KASNEB

DICT LEVEL II

COMPUTER NETWORKING

MONDAY: 22 May 2017.   Time Allowed: 3 hours.

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

QUESTION ONE
(a)   Explain the meaning of the following terms as used in computer networking:

      (i)   Hostname.   (2 marks)

      (ii)   Packet.   (2 marks)

      (iii)   Firewall.   (2 marks)

(b)   With the aid of a diagram, describe three essential elements of a communication system.   (6 marks)

(c)   You have been provided with the following networking components:

-    1 server.
-    3 computers.
-    1 switch.
-    One printer.

Required:
Illustrate how you would set up the following types of computer networks using the above components:

      (i)   Bus topology.   (4 marks)

      (ii)   Star topology.   (4 marks)
                                                                                       (Total: 20 marks)

QUESTION TWO
(a)   Define the term "client/server" in the context of computer networking.   (2 marks)

(b)   Various terms are used to describe data at different layers of the open systems interconnection (OSI) model as shown in the table below:

LAYERS	Reference to data
A	Data
Transport Layer	Segment
Network Layer	B
Data Link Layer	C
Physical Layer	D

Required:
(i)   State any two layers represented by cell A.   (2 marks)

(ii)   Identify the data reference under cells B, C and D.   (3 marks)

(c)   Outline five advantages of wireless Local Area Network (WLAN) over a cabled network.   (5 marks)

(d)   XYZ College is planning to set up a network to assist lecturers and students in research.

Examine four advantages and four disadvantages of setting up the above network.   (8 marks)
                                                                                       (Total: 20 marks)

QUESTION THREE

(a)   Differentiate between each of the following pairs of terms:

    (i)   "Service set identifier (SSID)" and "code division multiple access (CDMA)".   (4 marks)

    (ii)   "Hotspot" and "wireless access point (WAP)".   (4 marks)

    (iii)   "Intranet" and "extranet".   (4 marks)

(b)   Highlight four advantages of using fourth generation (4G) wireless technology.   (4 marks)

(c)   Windows Server is one of the most popular network operating systems.

    Analyse four common Windows Server in-built services in support of the above statement.   (4 marks)
    (Total: 20 marks)

QUESTION FOUR

(a)   Highlight three benefits of dedicated hardware routers over server based routers.   (6 marks)

(b)   Outline four factors to consider when purchasing a network interface card (NIC).   (4 marks)

(c)   Describe three types of user accounts based on access levels.   (6 marks)

(d)   Tom was troubleshooting his computer using the ping command. He came across the following errors:

    -   Unable to ping the NIC.

    -   Unable to ping own computer.

    -   Unable to ping domain name.

    -   Intermittent internet connections.

Required:
In each case, state the possible cause of the above errors.   (4 marks)
    (Total: 20 marks)

QUESTION FIVE

(a)   Differentiate between "standards" and "protocols" as used in computer networking.   (4 marks)

(b)   A firewall needs to be incorporated within an organisation's internal network in order to protect its information communication technology (ICT) assets.

Required:
    (i)   Define the term "firewall".   (2 marks)

    (ii)   Identify four types of firewalls that could be incorporated within an organisation's network.   (4 marks)

(c)   A local company is setting up its business and has leased three buildings; A, B and C. The buildings are approximately 50 metres apart and are in line of sight of each other. Building A will contain 6 offices for Administrative staff where each staff member will use a desktop computer. Building B will contain the central computer room, with two high capacity file servers, two web servers and one database server. The company will allow external customers to log in and purchase products from a catalogue accessible on one of the web servers. Building C will contain a large open plan office to be used by the Sales and Marketing staff who will work using laptop computers. As a network consultant, you have been engaged by the company to produce a network design plan for the organisation.

Required:
    (i)   Evaluate the types of networks and supporting equipment which should be deployed in buildings A, B and C.   (6 marks)

    (ii)   Advise the management on the networking options available to interconnect the three buildings.   (4 marks)
    (Total: 20 marks)

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