4.9   COMPUTER STUDIES (451)

4.9.1   Computer Studies Paper 1 (451/1)

SECTION A

*Answer **all** the questions in this section in the spaces provided.*

1.   State the components of a computer system which performs each of the following tasks:

    (a)   Comparisons of numbers   (1 mark)

    (b)   Convert data into a computer format   (1 mark)

    (c)   Coordinate operations of an entire computer   (1 mark)

2.   Explain the term *system files* as used in operating system.   (2 marks)

3.   Explain the term *label* as used in a spreadsheet program.   (2 marks)

4.   Ahmed noted that some documents in his office computer were illegally accessed from other computers in his organisation's network. State **two** control measures he should put in place to prevent further access.   (2 marks)

5.   **Figure 1** shows an extract from a spreadsheet program used by a shopkeeper to compute the total cost of items in stock.

	A	B	C	D
1	ITEM	UNITS	UNIT PRICE	TOTAL COST
2	Cooking fat	3	250	
3	Sugar	4	100	

Figure 1

Write a function that would be used to obtain the total cost of cooking fat.   (2 marks)

6.   Emmanuel inserted a textbox and typed some text in it while working with a desktop publishing program. He realised that some of the text he had typed was not visible. State **three** ways in which he could make the text visible.   (3 marks)

7.   Explain the term *software documentation* as used in systems development.   (2 marks)

8.   State **three** types of errors that may occur during computerised data processing.   (3 marks)

9.   Mary has been employed as a Web Administrator in a media house. State **three** official duties that she is likely to be assigned by her supervisor.   (3 marks)

10.   (a)   Explain the term *time slice* as used in computer data processing.   (2 marks)

(b)   State **two** advantages of multiprocessing mode of data processing.   (2 marks)

11.   State **two** differences between a *transaction file* and *a report file* as used in data processing.

    (2 marks)

12.   State **three** disk management activities that may be performed on a computer's hard disk during formatting operation.   (3 marks)

13.   The following is a list of computer output devices:

    speaker, plotter, screen projector, touch screen, LCD, printer

    Categorise each of them as either softcopy output devices or hardcopy output devices. (3 marks)

14.   State **three** advantages of using a wireless computer keyboard.   (3 marks)

15.   State **three** types of objects that may be created in a database during the design stage.   (3 marks)

SECTION B

Answer question 16 and any other three questions from this section.

16.   (a)   State **three** advantages of machine programming languages.   (3 marks)

    (b)   Describe **two** types of translators as used in computer programming.   (4 marks)

    (c)   A financial institution would like to computerise its loaning processes. To ascertain the legibility of a borrower, the system should accept a customer's ID number and check whether the customer has previously defaulted the repayment of any loan. If the customer is reported to have defaulted, the message DEFAULTER is displayed, otherwise the amount of loan requested is granted. If the amount requested is greater than or equal to 1 million, a repayment period of 6 years is displayed. If the amount is greater than 500,000 and less than 1 million, a repayment period of 3 years is displayed. Otherwise a repayment period of 1 year is displayed.

    Draw a flowchart to represent the logic of the computerised system.   (8 marks)

17.   (a)   With the aid of an example in each case, state **one** difference between a *nibble* and a *byte* as used in computer data representation.   (3 marks)

    (b)   (i)   Convert the binary number 11101.101_2 to its decimal number equivalent.

    (3 marks)

    (ii)   Perform the following binary arithmetic operation using two's complement.

    $1110_2 - 1001_2$ (2 marks)

    (c)   State **two** differences between BCD and EBCDIC as used in computer coding scheme.

    (4 marks)

(d) Ann would like to use a smartphone to attend an online lesson, where a teacher is using video presentation. State **three** features that a smartphone must have for an effective online lesson. (3 marks)

18. (a) Explain each of the following terms as used in Information and Communication Technology (ICT):

    (i) Electronic Funds Transfer (EFT) (2 marks)

    (ii) blogging (2 marks)

    (iii) simulation (2 marks)

(b) Distinguish between *pilot change over* and *parallel change over* as used in system development. (4 marks)

(c) Philip has developed a computerised system for a school and is currently in its implementation stage.

    (i) State **three** activities which he would carry out at this stage. (3 marks)

    (ii) State **two** technical personnel who would be involved during this stage. (2 marks)

19. (a) (i) State **two** differences between *serial* and *parallel* cables as used in computers. (4 marks)

    (ii) Name **four** cables other than those in 19(a)(i) that are used to connect a computer with other devices. (2 marks)

(b) Describe each of the following qualities of information:

    (i) Completeness (2 marks)

    (ii) Timeliness (2 marks)

(c) State the function of each of the following features in word processing:

    (i) Word wrap (1 mark)

    (ii) Sort (1 mark)

    (iii) Indent (1 mark)

(d) A hard disk of a computer was reported to have crashed. State **two** control measures that should have been put in place to prevent such an occurrence. (2 marks)

20. (a) Explain the effect of each of the following occurrence in a computer network:

    (i)   A bus network topology with a missing terminator   (2 mark)

    (ii)   A uni-directional ring network topology with one computer not operational

                                                      (2 marks)

    (iii)   A star network topology with a hub not operational   (2 marks)

(b) A school intends to connect their computer labs with the school administration block using a fibre optic cable. State **three** benefits that the school will realise from using the cable.

                                                           (3 marks)

(c) Explain each of the following terms as used in data security:

    (i)   recycle bin   (2 marks)

    (ii)   patch   (2 marks)

    (iii)   tapping   (2 marks)

4.9.2   Computer Studies Paper 2 (451/2)

1.   (a)   Open a word processing program and create the following document as it appears. Save it as *network*.   (43½ marks)

COMPUTER NETWORK

Net working is referred to as connecting computers, electronically for the purpose of sharing information. Resources such as files, applications, printers and software are commonly shared in a network.

Computer networks can be categorised based on size and topology as follows:

- ✔   ~~List Area Network~~ Local Area Network (LAN)
- ✔   Personal Area Network (PAN)
- ✔   Metropolitan Area Network (MAN)
- ✔   Wide Area Network (WAN)

A WAN is composed of *LAN, MAN* and *PAN* connected through the internet.
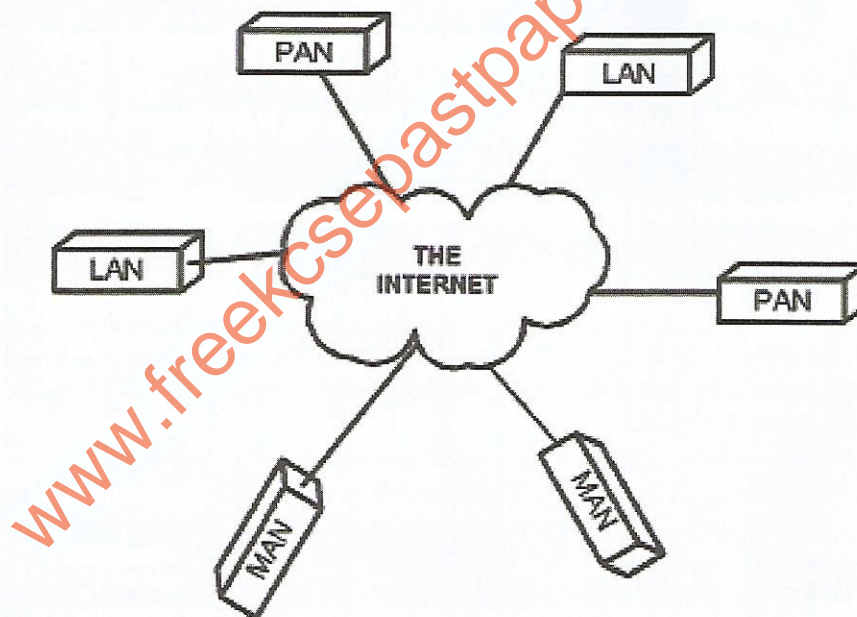
TYPES OF PHYSICAL TOPOLOGY

STAR TOPOLOGY
- Fast performance with few nodes and low network traffic.
- Hub can be upgraded easily.
- Easy to troubleshoot.

RING TOPOLOGY
i.   All data flows in one direction, reducing the chance of packet collisions.
ii. A network server is not needed to control network connectivity between each workstation.
iii. Data can transfer between workstations at high speeds.

DIFFERENCE BETWEEN STAR AND RING TOPOLOGY	
STAR	RING
The nodes are connected to the central hub or router	Every node is connected to its left and right side nodes
The hub is failure point	Every node are failure point
The information travels from central hub or router to all the nodes	The information travels from node to node in a ring manner in one direction

(b)   Apply each of the following formats on the document created:

   (i)   1.27 cm page margins at the top and bottom of the page.   (1 mark)

   (ii)   2 cm hanging indent on the bulleted text under the title Ring Topology.   (1 mark)

   (iii)   1.5 line spacing on the bulleted text under the title star topology.   (1 mark)

(c)   (i)   Insert the text COMPUTER NETWORKS as a footer.   (1 mark)

   (ii)   Format the footer created as follows:

      I.   Alignment: right   (½ mark)

      II.   Font size: 9   (½ mark)

      III.   Font style: italics   (½ mark)

(d)   Print out the document.   (1 mark)

2. The management of a car hire company intends to maintain its records using a database. You have been tasked with creating the database.

   (a) (i) Open a database program and create a database named **CarHire**.   (1 mark)

        (ii) Create the tables named Customers, Drivers, Vehicles and Expenses in the database created in 2(a)(i).   (21 marks)

Customers Table

Field Name	Data Type	Field Properties
CustomerID	Text	Field size 4
CustomerName	Text	Field size 25

Drivers Table

Field Name	Data Type	Field Properties
DriverID	Text	Field size 4
DriverName	Text	Field size 20

Vehicles Table

Field Name	Data Type	Field Properties
VehicleID	Text	Field size 6
VehicleDescription	Text	Field size 20

Expenses Table

Field Name	Data Type	Field Properties
VehicleID	Text	Field size 6
CustomerID	Text	Field size 4
DriverID	Text	Field size 4
ExpensesIncurred	Currency	Fixed
ExpenseDesc	Text	Field size 20
DateTravel	Text	Format: short Date
DistanceCovered	Number	

        (iii) Apply the appropriate primary key fields in the Customers, Drivers and Vehicles tables.   (3 marks)

        (iv) Create appropriate relationship among the tables.   (1½ marks)

(v) Create a form named **ExpensesForm** that would be used to enter data in the Expenses table and perform the following on the form.

- Modify the title as "Expense Entry"
- Bold the title
- Italicise the fields   (3 marks)

(b) Enter the following data into their respective tables.   (9½ marks)

Customers Table	
CustomerID	**CustomerName**
C001	ROSE
C002	JOEL
C003	MARION
C004	JOHNSTONE

Drivers Table	
DriverID	**DriverName**
V001	ANTONY
V002	HURRYSON
V003	LENNY
V004	PATRICK

Vehicles Table	
VehicleID	**VehicleDescription**
VW67	WISH
VF92	FIAT
KM13	MAZDA
VH84	HARRIER

Expenses Table

VehicleID	CustomerID	DriverID	Expenses Incurred	ExpenseDesc	DateTravel	Distance Covered
VW67	C001	V001	3000.00	Tyre replacement	7/14/2020	445
KM13	C004	V001	2000.00	Tyre replacement	7/21/2020	550
KM13	C001	V002	2000.00	Shocks	7/10/2020	380
VW67	C003	V002	1500.00	Shocks	7/5/2020	180
VF92	C002	V003	2000.00	Shocks	7/7/2020	600
VH84	C003	V003	3000.00	Bushes	7/24/2020	230
VF92	C001	V004	1500.00	Engine check	7/6/2020	425

(c)   Given that a customer is charged Ksh 15 per kilometre for the distance covered by a vehicle. Create a query that would display the fields; CustomerName, DriverName, ExpenseIncurred, DistanceCovered (in km) and a calculated field named **charges**, (*Hint: Charges = distance × 15 + ExpenseIncurred*).
Save the query as **vcharges**.   (5½ marks)

(d)   Create a report that would display the fields: CustomerName, DriverName, ExpenseDesc, ExpensesIncurred and the accumulated amount of all the expenses incurred. Save the report as expense **vreport**.   (2½ marks)

(e)   Print out later each of the following:

   (i)   Four tables

   (ii)   **vcharges** query

   (iii) **vreport** report.   (3 marks)