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Question 2

(a)(i) What is malware in computing?

ii. List **three** types of malware.

iii. State **three** symptoms of malware infection

iv. Give **two** ways of preventing malware infection.

Observation

The expected answer is:

(a) (i)   <u>**Meaning of Malware in Computing**</u>

– It is a <u>malicious software</u>/ any <u>software/program that disrupts computer operations.</u>

- Any software that gains access to private computer system to gather sensitive information or display unwanted/unsolicited adverts

- A <u>malicious software that is harmful to the computer or its user</u>.

(ii) <u>**Types of Malware**</u>

- Multipartite virus
- Resident virus
- Browser Hijacker
- Webscripting virus
- Macro virus
- Overwrite virus
- Direct Action virus
- Polymorphic/
    Metamorphic virus
- Rogueware
- Backdoor (Trapdoor)
- Computer virus
- Worm
- Trojan horse

- Spyware
- Adware
- Scareware
- Ransomware
- Rootkits
- Keyloggers

- **Symptoms of Malware Infection**

- Increased CPU usage

- Network connection problems
- Unusual behaviour of running programs/Glitching of programs
- Slow computer speed/ performance
- Freezing
- Modification or deletion of files
- Appearance of strange files, programs or desktop icons/tools
- Strange computer behaviour
- Unusual popup
- Unusual error messages
- URL re-direction
- Email spamming
- System/ Software Crash
- Demand for ransom
- Deletion/disappearance of files
- Corruption of files
- Unexpected closure of programs
- Unexpected change in security settings
- Reduced storage space
- Boot Failure

  (c) **Ways of preventing malware infection**
- Installation of antivirus/antimalware/antispyware program
- Regular update of installed antivirus/antimalware program
- Do not visit suspicious sites
- Do not click on suspicious links
- Do not download suspicious email attachment
- Avoid the installation/ use of pirated software or use licensed software
- Use secure Wi-Fi/ Internet access
- Do not accept unknown friendship request
- Configuration/installation of firewall
- Updating of software and operating system
- Scanning of files before downloading
- Regular virus scan of the computer
- Popup Blocking
- Use of Administrator's account only when necessary
- User Education
- System monitoring for suspicious activities
- Implement e-mail security
- Implement Spam Protection
- Secure access to computer/networks
- User authentication/use of password

The question tested the candidates' knowledge of computer malware. The Chief Examiner reported that a good number of the candidates who attempted this question were able to define malware but some did not understand the procedure to prevent malware infection.

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Question 1

State **one** function for **each** of the following utility programs.
a. disk space analyzers;
b. backup utility;
c. registry cleaner;
d. file manager;
e. uninstaller.

Observation

The expected answer is:
Question One
 (a) Functions of Disk space analyser
- Provides a display of summary of disks/drives, folders and files, and sizes
- Provides information on used and available space on the disks/drives
- Identify/indicate old / redundant files for optimization
- Scan the computer to generate a report detailing everything that uses disk space
- Monitor *disk usage*; issue alerts about low *disk space*
- Optimize Windows file storage by finding redundant, obsolete, and trivial files.
 (b) **Functions of Backup utility**
- Create duplicate/copies of data/file/applications for recovery/ retrieval in the event of data failure/accidental deletion
- Allow the user to copy selected files on entire hard disk/ tape content to desired location.
- Compresses the duplicate of copied files/ folders.
- Monitors the copying process and prompts the user of additional disk if required.
 (c) Functions of Registry cleaner
- Scans/Cleans windows registry
- Optimizes windows registry
- Remove redundant items from the windows registry
    (d) Functions of File manager

- Creates, opens and closes files/folders,
- Writes data to files, and read data from files
- Creates directories, determine characteristics of files and directories, and copy files
- Provides a user interface to manage/organise files and folders
- Provides a convenient way of performing routine
- (e) **Functions of Uninstaller**
- Removes installed programs/applications
- Removes other software or parts of it from a computer
- Removes profile files of a program

   The question tested the knowledge of the candidates on the functions of utility programs. The Chief Examiner reported that most of the candidates were able to state the functions of the listed utility programs.

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Question 3

(a) Name **two** computer professionals that use *CorelDraw* in the performance of their duties.

(b)(i) List **three** tools in the *CorelDraw* tool box.

(ii) Give **one** function of **each** tool listed in **3***(b)*(i).

(c)State **two** uses of *CorelDraw* as an application software.

Observation

The expected answer is:

- **_Computer professional using CorelDraw in the performance of their duties_**

- Graphic artist/designer
- Web designer
- Computer teacher /Educator.
- Computer operator
- Technical writers

(b)   (i)   **Tools in the CorelDraw Tool box**

- 2-leg callout Tool
- 2-point line Tool
- 3-point curve Tool
- 3-point ellipse Tool
- 3-point rectangle Tool
- Anchor editing
- Angular dimension Tool
- Artistic media Tool
- Attract and Repel tool
- Attributes eyedropper
- Bezier Tool
- Blend Tool
- Block shadow Tool

- B-spline Tool
- Colour eyedropper tool
- Connector Tool
- Contour Tool
- Crop tool
- Curve Tools
- Dimension Tools
- Distort Tool
- Drawing Tools
- Drop shadow Tool
- Effect Tools
- Ellipse Tool
- Envelope Tool
- Eraser tool
- Extrude Tool
- Eyedropper Tool
- Fill Tools
- Free Transform Tool
- Freehand Pick Tool
- Graph paper Tool
- Horizontal or vertical dimension Tool
- Impact Tool
- Inner shadow Tool
- Interactive fill Tool
- Knife tool
- Live Sketch Tool
- Mesh fill tool
- Outline Tool
- Pan Tool
- Parallel dimension Tool
- Pen Tool
- Pick Tools
- Polyline Tool
- Rectangle Tool
- Roughen tool
- Segment dimension Tool
- Shape Tool
- Shape Tools
- Smart drawing Tool
- Smart fill tool
- Smear Tool
- Smooth Tool
- Smudge tool
- Table Tool
- Text Tools
- The Polygon
- The Star Tool
- Transparency Tool
- Twirl Tool
- Virtual segment delete
- Zoom tool

(ii.)

Tools	Function
2-leg callout Tool	The 2-leg callout tool is used to draw a callout with a two-segment leader line.
2-point line Tool	The 2-point line tool is used to draw a straight two-point line segment.

3-point curve Tool	The 3-point curve tool is used to draw a curve by defining the start, end, and center points.
3-point ellipse Tool	The 3-point ellipse tool is used to draw ellipses at an angle.
3-point rectangle Tool	The 3-point rectangle tool is used to draw rectangles at an angle.
Anchor editing Tool	The Anchor editing tool is used to modify connector line anchor points.
Angular dimension Tool	The Angular dimension tool is used to draw angular dimension lines.
Artistic media Tool	The Artistic media tool provides access to the Preset, Brush, Sprayer, Calligraphic and Expression tools.
Attract and Repel Tool	The Attract and Repel tool is used to shape objects by attracting nodes to the cursor or pushing nodes away from the cursor.
Attributes eyedropper Tool	The Attributes eyedropper tool is used to select and copy object properties, such as line thickness, size and effects, from an object on the drawing window.
Bézier Tool	The Bézier tool is used to draw curves one segment at a time.
Blend Tool	The Blend tool is used to blend two objects.
Block shadow Tool	The Block shadow tool is used to add solid vector shadows to objects and text.
B-spline Tool	The B-spline tool lets you draw curved lines by setting control points that shape the curve without breaking it into segments.
Colour eyedropper tool	The Colour eyedropper tool is used to select and copy a colour from an object on the drawing window or the desktop.
Connector Tool	The Connector tool is used to draw straight, right-angle, and rounded right-angle connector lines.
Contour Tool	The Contour tool is used to apply a contour to an object.
Crop Tool	The Crop tool is used to remove unwanted areas in objects.
Freehand Tool	The Freehand tool is used to draw single line segments and curves.
Distort Tool	The Distort tool is used to apply a Push or Pull distortion, a Zipper distortion, or a Twister distortion to an object.
Drop shadow Tool	The Drop shadow tool is used to apply a drop shadow behind or below an object.
Ellipse Tool	The Ellipse tool is used to draw ellipses and circles
Envelope Tool	The Envelope tool is used to shape an object by dragging the nodes of the envelope.
Eraser tool	The Eraser tool is used to remove areas of your drawing
Extrude Tool	The Extrude tool is used to apply the illusion of depth to objects.
Free Transform Tool	The Free transform tool is used to transform an object by using the Free rotation, Free angle reflection, Free scale, and Free skew tools.
Freehand Pick Tool	The Freehand pick tool is used to select objects by using a freehand selection marquee.
Graph paper Tool	The Graph paper tool is used to draw a grid of lines similar to that on graph paper
Horizontal or vertical dimension Tool	The Horizontal or vertical dimension tool is used to draw horizontal or vertical dimension lines.
Impact Tool	The Impact tool is used to create graphic effects in a style inspired by comic books and contemporary illustrations.

Inner shadow Tool	The Inner shadow tool is used to apply a shadow inside an object
Interactive fill Tool	The Interactive fill tool is used to apply various fills.
Knife tool	The Knife tool is used to slice objects, groups of objects, and bitmaps along any path you specify.
Live Sketch Tool	The Live Sketch tool is used to sketch naturally with intelligent stroke adjustment.
Mesh fill tool .	The Mesh fill tool is used to apply a mesh grid to an object
Outline Tool	The Outline tool opens a fly out that gives you quick access to items such as the **Outline pen** dialog box and **Outline colour** dialog box. This tool is not displayed by default in the toolbox.
Pan Tool	The Pan tool is used to control which part of the drawing is visible in the drawing window.
Parallel dimension Tool	The Parallel dimension tool is used to draw slanted dimension lines.
Pen Tool	The Pen tool is used to draw curves one segment at a time.
Pick Tool	The Pick tool is used to select, size, skew, and rotate objects.
Polyline Tool	The Polyline tool is used to draw lines and curves in preview mode.
Rectangle Tool	The Rectangle tool is used to draw rectangles and squares.
Roughen tool	The Roughen tool is used to distort the outline of a vector object by dragging along the outline.
Segment dimension Tool	The Segment dimension is used to you display the distance between end nodes in single or multiple segments.
Shape Tool	The Shape tool is used to edit the shape of objects.
Smart drawing Tool	The Smart drawing tool converts your freehand strokes to basic shapes and smoothed curves
Smart fill tool	The Smart fill tool is used to create objects from enclosed areas and then apply a fill to those objects
Smear Tool	The Smear tool is used to shape an object by pulling extensions or making indents along its outline.
Smooth Tool	The Smooth tool is used to smooth curved objects to remove jagged edges and reduce the number of nodes
Smudge Tool	The Smudge tool is used to distort a vector object by dragging along its outline
Table Tool	The Table tool is used to draw and edit tables.
Text Tool	The Text tool is used to type words directly on the screen as artistic or paragraph text.
Shape Tool	The Common shapes tool is used to choose from a full set of shapes, including **hexagram**, a **smiley** face, and a **right-angle triangle**.
Polygon Tool	The Polygon tool is used to draw symmetrical polygons and stars.
Spiral Tool	The Spiral tool is used to draw symmetrical and logarithmic spirals.
Star Tool	The Star tool is used to draw perfect stars.
Transparency Tool	The Transparency tool is used to apply transparencies to objects.
Twirl Tool	The Twirl tool is used to create swirl effects by dragging along the edge of objects
Virtual segment delete	The Virtual segment delete tool is used to delete portions of objects that are between intersections
Zoom Tool	The Zoom tool is used to change the magnification level in the drawing window.

(c)   Uses of CorelDraw as application software

- Design of magazine
- Design of newspaper
- Design of books/ brochures
- Making illustration
- Designing logo
- Design of calendar /almanac
- Design of post cards
- Design of Invitation Cards
- Design of Complimentary Cards
- Design of Art works
- Design of posters
- Design of Handbills/Labels
- Design of Letterheads
- Design of Banner/Flexes
- Layout design
- Conversion of Bitmap images to vector objects
- Edit images/Photographs

The question tested the candidates' knowledge of graphic application such as CorelDRAW. However, it was reported that most of the candidates who attempted this question showed poor knowledge of the area tested.

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Question 4

(a) With reference to database management system, state:
i. **one** difference between *fragmentation* and *replication*.
ii. **two** advantages of *replication*.
(b)List **two**:
i. type of fragmentation;
ii. examples of relational database management system.

Observation

The expected answer is:
(a) (i) ***Difference between Fragmentation and Replication in Database management system***

	Fragmentation	Replication
I	Refers to the breaking down of a relation into fragments/small portions.	Refers to duplication of data or database objects or database from one database to another.
II	There is no duplication of data, database objects or databases.	There is duplication of data, database objects or databases.
III	The splitting up of parts of the overall database across different sites.	The process of maintaining updates to data across different sites

(ii)   **Two advantages of replication**
- Improved availability of data
- Improved performance
- Faster query evaluation / retrieval
- All resources are equally replicated regardless of their popularity/Same across locations
- Replicas have utilization rate proportional to their query rates
- Improved scalability

- Improved fault tolerance
- Simplified backup
- Enhanced disaster recovery
- Localised access

(b) (i) **Types of fragmentation**

- Horizontal fragmentation
- Vertical fragmentation
- Hybrid fragmentation

(ii) **Examples of Relational Database Management System**

- Oracle
- My SQL
- MSQL
- Microsoft SQL server
- DB2/IBM DB2
- PostgreSQL,
- SQLite
- MariaDB
- Microsoft Access
- Oracle Database
- IBM Informix
- Apache Derby
- H2 Database Engine
- Amazon Relational Database Service (Amazon RDS)
- Sybase ASE

The question tested the candidates' knowledge of relational database management system. It was reported that most of the candidates who attempted this question demonstrated poor knowledge of the area tested.

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Question 5

Table 1 shows the specification of two laptop computers. *Use the table to answer questions* **5***(a) to* **5***(e).*

Table 1

Feature	Laptop A	Laptop B
Processor Speed	**2.6** *GHz* **900** *MHz* **2** *MB*	**1.8** *GHz,* **620** *GHz,* **1** *MB*
Hard Drive	**500** *GB*	
Screen Size	**15.6** inches	**320** *GB*
Operating System	Windows **10** Pro	**10.1** inches
Wireless Capability	Disabled	Windows **7** Ultimate
Webcam	No	Enabled
Bluetooth	Yes	1.6 MP
Battery Life	**2** Hours	No
Weight.	**3.2** *Kg*	**6** Hours
		2.4 *Kg*

(a) Which laptop will **likely** boot faster?

(b) Calculate the **maximum** number of bytes of data that can be stored in the hard disk of:

i. Laptop **A;**

ii. Laptop **B.**

(c) State the type of *operating system* installed in both laptop **A** and laptop **B.**

(d) State **one** function of the Bluetooth in laptop **A.**

(e) A certain salesperson makes a long trip by road as part of his job and also uses the computer for live communications with his customers.

i. Which of the laptop is more **suitable** for the salesperson?

ii. Name **three** features of the laptop chosen in **5***(e)*(i) that makes it more **suitable** than the other.

iii. Give **one** reason for choosing each of the features in **5***(e)(*ii).

Observation

The expected answer is:

(a) **Laptop likely to boot faster**

- Laptop A

(b) **Calculation of maximum number of bytes of data can be stored in the hard disk of:**

(i)   Laptop A = 500GB

= 500×1024×1024×1024 bytes

=536,870,912,000 bytes

- Laptop B = 320 GB

       = 320×1024×1024×1024 bytes

= 343, 597, 383,680 bytes

(c) **Type of operating system installed in Laptop A and Laptop B**

- Graphical user interface/Multi-user OS/ Windows OS

(d)   **Functions of Bluetooth in Laptop A**

- File transfer between devices and the computer
- Transfer/share data/files/photos/ music from phone to laptop/laptop to phone
- Transfer/share files/ photos/music from to computer to another computer
- Synchronize devices with the computer
- Connect audio devices to the computer
- Connect mice to the computer
- Connect printers to the computer
- Connect games devices to the computer
- Connect Xbox controllers to the computer
- Connect keyboards to the computer
- Connect DLNA (digital living network alliance) devices to the computer

(e)   (i)   **Laptop more suitable for the salesperson**

- Laptop B
- **Features for selecting Laptop B in 5(e)(i)**

-Webcam

- Battery life
- Weight
- Screen size
- Wireless capability

- **Reasons for choosing the features in 5(e)(ii)**

Feature	Reasons
Webcam	• SupportVoIP / • Support video messaging • For Teleconference. • For Live Broadcast/Communication
Battery life	• Laptop B has longer battery life. • Not to be charged often.
Weight	• Laptop B is lighter. • Convenient for carrying
Screen size	• Portability • Require smaller space
Wireless capability	• Easy connection to internet access point (Wi-Fi, Hotspots) • Connect with devices without cable • Access network resources without cable

The question tested candidates' ability to apply their knowledge on computer hardware to solve real life problems. The Chief Examiner reported that candidates'

responses in this question revealed candidates' ability to apply knowledge of computer hardware in solving real life problems.

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Question 6

(a) A class teacher uses a database to keep students' records. **Table 2** shows part of the   information in the database.

Table 2

Index number	Surname	First Name	Date of Birth
4012503001	Umar	Mohammed	25/10/1999
4076666022	Ugbede	Micheal	01/07/2001
4132738017	Okeke	Obinna	22/03/2002
4190328027	Musa	Abdullahi	31/07/1998
42303280011	Ayodele	Funsho	23/05/1999
4300206001	Okeke	Ibanga	21/04/2021
4360107015	clerke	micheal	25/01/1999

   i. identify   the   primary
      key;
  ii. give **one** reason for the answer in **6***(a)(*i);
 iii. explain **three** methods the teacher could employ in order to secure the students' data

   (b)   Outline   the   steps   to   create   a   drop-down   list   in   an   *MS   Excel*
   worksheet.   (c)The image in **Figure 1** is captured from a
   product in a supermarket. *Use the image to answer questions* **6***(c)*(i) to **6***(c)*(iii).

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Figure 1

i. identify the image in **Figure 1.**
ii. give **two** other application areas of the image in **Figure**
iii. state **three** benefits of using the image in **Figure 1.**

Observation

The expected answer is:
- (i) <u>**Primary key identification**</u>
- Index number

(ii)   **Reason for the choice in 6(a)(i)**
- Unique identifier/ Uniquely identified each student
- No duplication/Repeated value
- No null value/Cannot be empty.

(iii)   <u>**Methods the teacher could employ to secure students data**</u>
  - *Data Encryption*: data cannot be read by unauthorized persons. A key is needed to unlock the code.
  - *Use of firewall*: prevent illegal access / hacker to the student database (This can be implemented by software, hardware or combination of both).
  - *Use of antivirus/antimalware:* to protect from viruses and malware.
  - *Use of passwords*: prevent unauthorized access to sensitive data. Users can be made to change these frequently to ensure data is protected.
  - *Physical protection:* of the host computer for the DB

(b) <u>**Steps to create a drop-down list in an Ms Excel worksheet**</u>
- Select the cell or range of cells where the dropdown list will be added
- Click on Data tab
- Click on Data Validation
- Select Settings tab
- Select 'List" from the allow: drop- down box
- Enter the list source: field using a comma to separate the items or select a range of cells
- from the wok sheet

<div align="center">OR</div>

- In a new worksheet, type the entries you want to appear in your drop-down list/ Select the cell in the worksheet where you want the drop-down list.
- Go to the **Data** tab on the Ribbon,
- Click on **Data Validation**.
- On the **Settings** tab, in the **Allow** box, click **List**.
- Click in the **Source** box, and Type in the data options separated by comma/ select your list range
- Click on OK

OR

- In a new worksheet, type the entries you want to appear in your drop-down list, select the entries, and give it a name in the Name box
- Select the cell in the worksheet where you want the drop-down list.
- Click on the **Data** tab on the Ribbon, then click on **Data Validation.**
- On the **Settings** tab, in the **Allow** box, click **List.**
- Click in the **Source** box, then press F3, and select the range name, click ok
- Click on OK

(c) (i) <u>**Identification image in Figure1**</u>
- Barcode

(ii) <u>**Other application areas of Barcode**</u>

- Events ticketing
- Courier services
- Immigration services
- Travels ticketing
- Movies ticketing

- Advertising
- Games
- Tracking food intake / products
- Healthcare Industries
- Product branding / identification (manufacturing)
- Library
- Bookshop
- Supermarket/ Retail Company
- Examination Question Papers/Scripts identification
- Shipping Industries

- **Benefits of using the image**

- Provides pricing information.
- Reduced training time for staff
- Improved inventory control
- Low cost of implementation
- Quick access to product information
- Accurate and eliminate human error
- Product authentication
- Less employee training is required
- Time-saving.
- Tracking of products
- Product identification

This question tested candidates' knowledge of database management system and their skill on ICT application. The Chief Examiner reported that the candidates showed knowledge of database management system but displayed good skill of ICT application..

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