



basic education

Department:
Basic Education
REPUBLIC OF SOUTH AFRICA

SENIOR CERTIFICATE EXAMINATIONS/ NATIONAL SENIOR CERTIFICATE EXAMINATIONS

COMPUTER APPLICATIONS TECHNOLOGY P2

2022

MARKS: 150

TIME: 3 hours

This question paper consists of 17 pages.

INSTRUCTIONS AND INFORMATION

1. This question paper consists of:

SECTION A (25)
SECTION B (75)
SECTION C (50)
2. Answer ALL the questions.
3. Number the answers correctly according to the numbering system used in this question paper.
4. Start EACH question on a NEW page.
5. Do NOT write in the right-hand margin of the ANSWER BOOK.
6. Leave an open line after EACH subquestion.
7. Generally, one mark is allocated per fact; therefore, a 2-mark question would require TWO facts, etc.
8. Read the questions carefully. DO NOT give more options than the question requires as they will NOT be marked.
9. All answers MUST be related to Computer Applications Technology.
10. Unless otherwise specified, answers such as 'cheaper', 'slower'/'faster', etc. will NOT be accepted.
11. Do NOT use brand names in your answers, unless specifically required.
12. Write neatly and legibly.

SECTION A**QUESTION 1: MULTIPLE-CHOICE QUESTIONS**

Various options are given as possible answers to the following questions. Choose the answer and write only the letter (A–D) next to the question numbers (1.1 to 1.10) in the ANSWER BOOK, e.g. 1.11 D.

- 1.1 A user may suffer from ... when spending a lot of time at the computer.
- A RSI
 - B ALU
 - C ICT
 - D HCI
- (1)
- 1.2 Which ONE of the following is most likely to be the size of a data bundle bought by a user?
- A 1 MB
 - B 100 KB
 - C 1 GB
 - D 5 TB
- (1)
- 1.3 A ... could be used to input data instead of using the number keys on a keyboard.
- A barcode scanner
 - B touch pad
 - C joystick
 - D game controller
- (1)
- 1.4 Which ONE of the following is NOT an example of a biometric input device?
- A Fingerprint reader
 - B Microphone
 - C Touch pad
 - D Camera
- (1)

1.5 Study the screenshot below and answer the question that follows.

	A	B	C	D	E	F	G
1			Mark	Result			
2			68				

Which ONE of the following options would display the CORRECT result for cell D2?

- A Fail
- B 30
- C " "
- D Pass

(1)

1.6 Which ONE of the following functions is used in a database, but NOT in a spreadsheet?

- A LEN
- B AVG
- C MAX
- D COUNT

(1)

1.7 In a word processor, the ... fixes misspelt words without user input.

- A Thesaurus
- B Find and Replace
- C Spelling & Grammar
- D AutoCorrect

(1)

1.8 This type of file contains data which is most likely separated by commas:

- A csv
- B doc
- C xls
- D ppt

(1)

1.9 Which ONE of the following is the fastest option for permanent storage?

- A DVD
- B ROM
- C HDD
- D Cache

(1)

1.10 A point of sales (POS) system is typically linked to a ...

- A spreadsheet.
- B database.
- C text file.
- D jpeg file.

(1)

[10]

QUESTION 2: MATCHING ITEMS

Choose a term/concept from COLUMN B that matches the description in COLUMN A. Write only the letter (A–T) next to the question numbers (2.1 to 2.10) in the ANSWER BOOK, e.g. 2.11 U.

COLUMN A		COLUMN B	
2.1	A program that enables a user to organise his/her files and folders	A	RAM
2.2	An application most suited for data analysis	B	LTE
2.3	Software that attempts to collect information about a user without his/her permission	C	word processing
2.4	A spreadsheet function that extracts text data	D	resolution
2.5	A standard used in wireless communication that provides high-speed data transfers	E	WAN
2.6	Certain internet services are given bandwidth preference over other services	F	shaping
2.7	An important consideration when purchasing a monitor	G	Disk Cleanup
2.8	A hardware component that will improve the performance of a computer	H	spyware
2.9	Type of network that connects offices of a company that are located in different cities	I	SUM
2.10	Unwanted e-mail sent to a large number of users	J	spam
		K	MID
		L	keyboard
		M	LAN
		N	phishing
		O	VoIP
		P	Explorer
		Q	adware
		R	spreadsheet
		S	brightness
		T	Bluetooth

(10 x 1)

[10]

QUESTION 3: TRUE/FALSE ITEMS

Indicate whether the following statements are TRUE or FALSE. Write 'true' or 'false' next to the question numbers (3.1 to 3.5) in the ANSWER BOOK. If the statement is true, write 'TRUE'. If the statement is false, write 'FALSE' and change the underlined word(s) to make the statement TRUE. (Do NOT simply use the word 'NOT' to change the statement.)

NO mark will be awarded if FALSE is written without a correct answer.

EXAMPLES:

QUESTION	ANSWER
The initial start-up instructions are stored in the <u>ROM</u> .	True
An <u>NIC</u> has slots for hardware components such as the CPU.	False – Motherboard

- 3.1 HDMI cables transfer only video signals. (1)
- 3.2 NFC requires the devices to be very close together for data transfer. (1)
- 3.3 Data transfer speed in a Wi-Fi network could be improved if physical obstructions are removed. (1)
- 3.4 Grid computing enables computers to perform intellectual tasks, such as decision-making and problem-solving. (1)
- 3.5 Cryptocurrencies are very large data sets that are analysed to reveal trends. (1)

[5]**TOTAL SECTION A: 25**

SECTION B**QUESTION 4: SYSTEMS TECHNOLOGIES**

- 4.1 Discuss the concept of *communication* in the information processing cycle. (1)
- 4.2 Give ONE reason why a hard disk drive is not preferred in a laptop. (1)
- 4.3 You wish to set up a 'small office home office' (SOHO) with four computers.
- 4.3.1 Explain TWO criteria that could be used to select a printer for this office. (2)
- 4.3.2 What type of software licence would you prefer when installing an office suite for this office? Motivate your answer. (2)
- 4.3.3 Give TWO benefits of buying a UPS for this office. (2)
- 4.3.4 Which problem could arise if the printer purchased for this office is NOT set as the default printer? (1)
- 4.4 Give TWO disadvantages of using open-source software. (2)
- 4.5 Explain why a user would prefer using a virtual keyboard rather than a physical keyboard. (1)
- 4.6 It is good practice to make backups of data.
- 4.6.1 Give TWO reasons why it is important to make offline backups. (2)
- 4.6.2 Why should you never make an offline backup of your work on the same device as the original work? (1)
- 4.6.3 Name a file extension which is typically associated with backup file sizes that were reduced. (1)
- 4.7 What change must be made to the resolution of a monitor to assist a visually impaired user? (1)
- 4.8 What is the Task Manager most commonly used for? (1)
- 4.9 Give TWO reasons why it is not recommended that an accountant uses a trial version of financial software. (2)

- 4.10 Suggest TWO ways to resolve the problem of a mouse that does not work properly, other than replacing the mouse. (2)
- 4.11 Name TWO kinds of information found in the metadata of a file. (2)
- 4.12 Discuss the purpose of a QR code. (1)
- [25]**

QUESTION 5: INTERNET AND NETWORK TECHNOLOGIES

- 5.1 Name a type of internet connection you would recommend for a school AND motivate your answer. (2)
- 5.2 What is the advantage of using the https protocol over the http protocol? (1)
- 5.3 Suggest TWO ways in which software can be used to protect a network from unauthorised users. (2)
- 5.4 Give TWO reasons why some users prefer to listen to a podcast rather than reading text. (2)
- 5.5 A particular router has only four network cable ports.
State TWO ways to connect more than four devices to this router. (2)
- 5.6 Give TWO reasons why internet access is important to users of computing devices. (2)
- 5.7 Discuss TWO advantages of using a VPN. (2)
- 5.8 You cannot connect to the computer network in your classroom.
Suggest TWO possible ways to resolve this problem. (2)
- [15]**

QUESTION 6: INFORMATION MANAGEMENT

- 6.1 Complete the table below to indicate whether each question is suitable or unsuitable to be used in a questionnaire, and give a motivation for your answer.

1 Question number	2 Question	3 Suitable/ Unsuitable	4 Motivation
Question 1	What are the benefits of cloud computing?		
Question 2	Do you store your data in the cloud?		

Copy only columns 1, 3 and 4 in the ANSWER BOOK to answer this question. (4)

- 6.2 Study the extract below and answer the questions that follow.

Cape Town University Press

Giant Elon Musk rocket is about to CRASH into the Moon after '7 years of chaos'

Harry Pettit, Deputy Technology and Science Editor

14:15, 25 Jan 2022 Updated: 17:01, 25 Jan 2022

A FOUR-TONNE chunk of a SpaceX is on a collision course with the Moon, according to online space junk trackers.

The out-of-control booster was launched from Florida in February 2015 as part of the rocket firm's first interplanetary mission.

- 6.2.1 What makes Harry Pettit a trustworthy source? (1)
- 6.2.2 How would you check if the information above is accurate? (1)
- 6.3 Which TWO word processing features can be used to reference a source in a document? (2)
- 6.4 You gathered data from various sources when you did your PAT. You wish to use graphs to display your data analysis in the report.
- 6.4.1 Give ONE reason to use a pie chart. (1)
- 6.4.2 Give ONE reason to use a line chart. (1)

[10]

QUESTION 7: SOCIAL IMPLICATIONS

- 7.1 Give an example of a product that is considered to be intellectual property. (1)
 - 7.2 Give TWO guidelines that can be found in a school's BYOD policy. (2)
 - 7.3 Suggest TWO ways in which to prevent computer hardware theft in schools. (2)
 - 7.4 Explain TWO ways to protect your privacy when using the internet through a public hotspot. (2)
 - 7.5 Give ONE reason why some companies may NOT allow their employees to telecommute. (1)
 - 7.6 Discuss TWO negative effects a user can experience if he/she overuses social media. (2)
- [10]**

QUESTION 8: SOLUTION DEVELOPMENT

8.1 What is the purpose of using a bookmark in a word processing document? (1)

8.2 How would you prepare the headings in a word processing document to appear in an automatic table of contents? (1)

8.3 Study the design of the following database table:

Field Name	Data Type	Description (Optional)
sName	Short Text	Name of student
sSurname	Short Text	Surname of student
SA_ID	Short Text	South African ID
Gender	Short Text	Male or Female
Age	Number	Age in current year
School	Short Text	Name of school

8.3.1 Suggest an appropriate size for the *sName* field. (1)

8.3.2 Which field would be appropriate to use as the primary key? (1)

8.3.3 Which data type could be used for the *Gender* field to select an appropriate option? (1)

8.3.4 Which field property of the *School* field would automatically insert data in that field? (1)

8.4 A database contains several uniform resource locators (URLs).

How would you be able to display all the records of URLs ending in '.com' in a database query? (1)

8.5 Which spreadsheet feature can be used to copy the results of a formula from one spreadsheet to appear in another spreadsheet without copying the formula? (1)

8.6 The spreadsheet below indicates the marks of some learners.

	A	B	C
1		Raw Marks	Final Mark
2	Learner 1	34.4	35
3	Learner 2	50.6	51
4	Learner 3	22.23	23
5	Learner 4	41.45	42
6			0

8.6.1 The marks in column B were adjusted to display the next whole number in column C.

Which spreadsheet function was used to return the next whole number in column C? (1)

8.6.2 The function displayed in the formula bar was used to give the result in cell C6.

Why is the result in cell C6 a '0' (zero)? (1)

8.6.3 Which spreadsheet function can be used to determine the number of learners listed in the spreadsheet? (1)

8.7 The following HTML code appeared in an HTML editor:

```
<html>
<body>

<h1>Shopping List</h1>

<ul>
<li>Butter</li>
<li>Eggs</li>
<li>Flour</li>
</ul>

<ol start="20">
<li>Soap</li>
<li>Shampoo</li>
<li>Toothpaste</li>
</ol>

</body>
</html>
```

Illustrate how this web page would display.

(4)
[15]

TOTAL SECTION B: 75

SECTION C**QUESTION 9: INTEGRATED SCENARIO**

The Representative Council of Learners (RCL) of your school plans to host a talent show to raise funds. You are required to use your computer knowledge to assist the RCL.

9.1 The school will use computers to manage the talent show.

9.1.1 Complete the missing specifications of an entry-level computer that could be used by the RCL. Write the answer next to the question number (9.1.1(a) to (c)) in the ANSWER BOOK.

Computer Specifications	
Monitor	17" LCD display
(a) ...	Celeron
Storage device	(b) ...
(c) ...	802.11

(3)

9.1.2 Why would the RCL prefer to use tablets for the registration of participants in the talent show? (1)

9.1.3 One of the RCL members recommended that they use voice recognition software for the registration.

Give ONE motivation to support this suggestion AND ONE motivation NOT to support this suggestion. (2)

9.2 Give TWO reasons why it would be better to use online storage for fundraising data. (2)

9.3 Some participants complain that when they click on the link to the talent show website, it opens to an unexpected website.

Give ONE reason why this occurs AND how can it be avoided in the future. (2)

- 9.4 The worksheet below summarises ticket sales for the talent show for one night.

	A	B	C	D
1	SUMMARY OF TICKET SALES			
2				
3	Type of Seat	Number of Seats	Tickets Sold	Sales Amount
4	Block 1 - Front	200	147	7350
5	Block 2 - Middle	250	180	8100
6	Block 3 - Back	300	215	8600
7				

- 9.4.1 State TWO spreadsheet features that the RCL could use so that fewer errors are made when data is captured. (2)
- 9.4.2 The data of the ticket sales are stored in another worksheet.
State TWO methods that were possibly used to display the number of tickets sold in column C, other than copying and pasting. (2)
- 9.4.3 Suggest TWO formatting changes that can make the worksheet more user-friendly. (2)
- 9.5 Discuss TWO ways in which ICTs can be used to distribute programmes, posters, tickets and duty rosters for the talent show, instead of printing them. (2)
- 9.6 After the talent show, the audience can use their smartphones to vote for the best act.
Give TWO advantages of using an online form to vote. (2)
- 9.7 Trophies will be presented on the night of the talent show.
Give TWO advantages of printing trophies with a 3D printer. (2)
- 9.8 A member of the RCL will take photographs on the night of the talent show.
9.8.1 State ONE possible problem when using a smartphone to take photographs at night. (1)
9.8.2 Suggest TWO guidelines to follow before posting photographs on social media platforms. (2)

[25]

QUESTION 10: INTEGRATED SCENARIO

An educational organisation offers online lessons and distance learning. The organisation will need ICTs to run smoothly.

- 10.1 The laptops for the organisation need to be upgraded.
Give a reason why the organisation may not be able to upgrade the laptops. (1)
- 10.2 Internet connectivity is very important in an online educational environment.
- 10.2.1 Give the definition of *broadband*. (2)
- 10.2.2 What is the unit of measurement for data transfer speed? (1)
- 10.2.3 What effect could throttling have on the users while learning online? (1)
- 10.3 Give TWO disadvantages of video conferencing to deliver or access online lessons. (2)
- 10.4 Any organisation should be aware of privacy and security issues.
- 10.4.1 Explain why a keylogger is a threat to online privacy and security. (2)
- 10.4.2 Give TWO advantages of two-factor or multi-factor authentication for the user. (2)
- 10.4.3 Give TWO examples of web services that use two-factor or multi-factor authentication. (2)
- 10.5 Give TWO reasons why some students did not receive e-mails that were sent out. (2)
- 10.6 Students will need to install add-ons to use the organisation's software.
- 10.6.1 What is the benefit of an add-on? (1)
- 10.6.2 Give ONE example of an add-on. (1)
- 10.7 Some lessons require augmented reality.
Explain the concept of *augmented reality*. (1)
- 10.8 Give TWO advantages of online learning for the learner. (2)
- 10.9 The organisation requires learners to submit their work as PDF files.
Which application, other than a PDF reader, can teachers use to open PDF files? (1)

10.10 A part of the organisation's website does not display correctly.

Study the HTML code below and answer the questions that follow.

```
<html>
<title>Online Courses</title>
  <body>
    
    <h1>Select a course</h1>
    <table border="1">
      <tr>
        <td>Options</td>
      </tr>
      <tr>
        <td>Blue</td>
        <td>Green</td>
      </tr>
    </table>
  </body>
</html>
```

10.10.1 Why does the title 'Online Courses' not display in the web browser tab as expected? (1)

10.10.2 How many columns will there be in the first row of the table if the HTML code above is displayed in a web browser? (1)

10.11 An image in another web page of the organisation displays incorrectly. The file name and file extension are correct in the HTML code, but only a part of the image displays in the browser.

Suggest TWO ways to ensure that the image is fully visible. (2)
[25]

TOTAL SECTION C: 50
GRAND TOTAL: 150



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2022

MARKING GUIDELINES

MARKS: 150

These marking guidelines consist of 20 pages.

SUGGESTIONS AND RECOMMENDATIONS TO MARKERS

- Revisit the questions and the marking guideline frequently during the marking session.
- It is advisable to read (and re-read) the question frequently together with the candidate's response to check that they correlate, so that you are not misled by the candidate's statements/answers.
- Be careful not to focus on keywords or general statements, but rather read the entire answer. If in doubt, read the entire answer and then the question and the answer in the marking guideline.
 - Ask yourself or your senior marker if the response could 'fit' into the marking guideline before allocating the correct marks to the candidate.
 - Accept correct answers that are expressed differently, e.g. the marking guideline states 'slow' and the learner responds with 'not fast'.
- Beware of overlapping answers to a specific question. In general, ONE mark is awarded per fact.
- Do not choose answers on the candidate's behalf. Where a question requires a candidate to LIST or NAME, mark the first number of instances required, e.g. the first TWO facts if the candidate presents a list of FIVE facts and only TWO facts were required, even if presented in paragraph format.
- Questions requiring longer answers must be regarded as a single unit. Marks can be awarded if correct statements are found anywhere in the paragraph.

SECTION A

QUESTION 1: MULTIPLE-CHOICE

1.1	A	✓	1
1.2	C	✓	1
1.3	A	✓	1
1.4	C	✓	1
1.5	D	✓	1
1.6	B	✓	1
1.7	D	✓	1
1.8	A	✓	1
1.9	C	✓	1
1.10	B	✓	1
Total: [10]			

QUESTION 2: MATCHING ITEMS

2.1	P	✓	1
2.2	R	✓	1
2.3	H	✓	1
2.4	K	✓	1
2.5	B	✓	1
2.6	F	✓	1
2.7	D	✓	1
2.8	A	✓	1
2.9	E	✓	1
2.10	J	✓	1
Total: [10]			

QUESTION 3: TRUE/FALSE ITEMS

(Note to marker: In Question, 3.1, 3.4 and 3.5 candidates need to provide both the word 'False' and the correct term, e.g. Motherboard, in order to get the mark.)

3.1	False, VGA/DVI ✓	1
3.2	True ✓	1
3.3	True ✓	1
3.4	False, Artificial Intelligence ✓ /AI	1
3.5	False, Big Data ✓	1
		[5]

TOTAL SECTION A: [25]

SECTION B

QUESTION 4: SYSTEMS TECHNOLOGIES

4.1	<p>Concept of communication in the information processing cycle</p> <p>The result of processing is shared ✓ with users/other devices connected to each other</p>		1												
4.2	<p>ONE reason why a hard disk drive is NOT preferred in a laptop</p> <p>1) HDD can be easily damaged because of moving parts 2) Heavier than other options 3) Uses more electricity/Depletes battery faster</p> <p style="text-align: right;">✓ (Any one)</p>		1												
4.3.1	<p>TWO criteria for selecting a printer for a SOHO</p> <p>1) Speed: Pages per minute/Productivity 2) Budget consideration: Cost of printer/Cost of printing 3) Print quality: Quality of printouts required/DPI 4) Paper: Variety of paper sizes/thickness required 5) Durability: Maximum printouts per printer life cycle 6) Size of printer: Available physical space/multiple trays 7) Colour: Monochrome or colour printing required 8) Type of printer: Suitability for SOHO, e.g. Multifunction printer 9) Connectivity: Network printer, e.g. Wireless 10) System compatibility: Compatibility between device and printer</p> <p style="text-align: right;">✓✓ (Any two)</p> <p>(Note to marker: Do NOT accept one-word answers)</p>		2												
4.3.2	<p>Type of software license for a SOHO</p> <table border="1" data-bbox="300 1406 1225 1966"> <thead> <tr> <th data-bbox="300 1406 721 1458">Type of software license ✓</th> <th data-bbox="721 1406 1225 1458">Motivation ✓</th> </tr> </thead> <tbody> <tr> <td data-bbox="300 1458 721 1644">Site License/Once-off license</td> <td data-bbox="721 1458 1225 1644">No intention of upgrading Software of all the computers on the site will be licensed Can be installed on several computers simultaneously</td> </tr> <tr> <td data-bbox="300 1644 721 1731">Subscription license</td> <td data-bbox="721 1644 1225 1731">Latest features and updates are always available</td> </tr> <tr> <td data-bbox="300 1731 721 1818">Multi-user license</td> <td data-bbox="721 1731 1225 1818">Intended for multiple users, irrespective of number of computers</td> </tr> <tr> <td data-bbox="300 1818 721 1906">Multiple Activation Key (MAK)</td> <td data-bbox="721 1818 1225 1906">Licenses are purchased in a bundle which depletes as licenses are used</td> </tr> <tr> <td data-bbox="300 1906 721 1966">GNU/Open Source license</td> <td data-bbox="721 1906 1225 1966">Low budget/start-up business</td> </tr> </tbody> </table> <p>(Note to marker: Motivation must match the type of license)</p>	Type of software license ✓	Motivation ✓	Site License/Once-off license	No intention of upgrading Software of all the computers on the site will be licensed Can be installed on several computers simultaneously	Subscription license	Latest features and updates are always available	Multi-user license	Intended for multiple users, irrespective of number of computers	Multiple Activation Key (MAK)	Licenses are purchased in a bundle which depletes as licenses are used	GNU/Open Source license	Low budget/start-up business		2
Type of software license ✓	Motivation ✓														
Site License/Once-off license	No intention of upgrading Software of all the computers on the site will be licensed Can be installed on several computers simultaneously														
Subscription license	Latest features and updates are always available														
Multi-user license	Intended for multiple users, irrespective of number of computers														
Multiple Activation Key (MAK)	Licenses are purchased in a bundle which depletes as licenses are used														
GNU/Open Source license	Low budget/start-up business														

4.3.3	<p>TWO benefits of UPS for a SOHO</p> <ol style="list-style-type: none"> 1) Backup power for limited time 2) Safe/Automatic shutdown 3) Allows time to save work/Prevents loss of data 4) Protects equipment against power surges/fluctuations <p style="text-align: right;">✓✓ (Any two)</p>	2	
4.3.4	<p>Problem related to a printer not set as the default printer</p> <ol style="list-style-type: none"> 1) Print jobs go to the wrong printer 2) Nothing will print 3) May print with incorrect layout formatting 4) Less productive – will need to select a printer every time to print <p style="text-align: right;">✓ (Any one)</p>	1	7
4.4	<p>TWO disadvantages of using open source software</p> <ol style="list-style-type: none"> 1) No regular updates 2) No official support 3) Lack of 'Help' features 4) Open to software vulnerabilities, e.g. hacking with malicious code 5) Lack of proper testing of the software for bugs <p style="text-align: right;">✓✓ (Any two)</p>		2
4.5	<p>ONE reason for preferring a virtual keyboard over a physical keyboard</p> <ol style="list-style-type: none"> 1) Use less physical desk space 2) Improves portability of the device 3) Can customise the keyboard 4) Surface on which virtual keyboard is projected may be easier to clean <p style="text-align: right;">✓ (Any one)</p>		1

4.6.1	<p>TWO reasons why <u>offline</u> backups are important</p> <ol style="list-style-type: none"> 1) Backup files are accessible when no internet is available 2) Faster to restore data from a local source 3) Not reliant on a 3rd party for data security 4) Have a backup in case of ransomware 5) No need to pay a subscription <p style="text-align: right;">✓✓ (Any two)</p>	2	
4.6.2	<p>Reason for NOT making a backup on the same device as the original work</p> <p>The backup can be destroyed/infected/lost/stolen together with the original work ✓</p>	1	
4.6.3	<p>File extension for files that have been reduced in size</p> <p>.Zip/.Rar/.7Z, etc. ✓</p>	1	4
4.7	<p>Change made to resolution to assist a visually impaired user</p> <p>Resolution decreased ✓ to make the display appear larger</p>		1
4.8	<p>Most common use of the Task Manager</p> <ol style="list-style-type: none"> 1) Close a non-responding program/Forcefully end a task 2) Check computer performance to identify processes causing issues <p style="text-align: right;">✓ (Any one)</p>		1
4.9	<p>TWO reasons why an accountant should not use a trial version of financial software</p> <ol style="list-style-type: none"> 1) Lose data when trial expires/Program becomes unusable 2) Unable to upgrade to the full version 3) Not all features are available/limited functionality 4) Could result in loss of income for the business <p style="text-align: right;">✓✓ (Any two)</p>		2
4.10	<p>TWO ways to resolve the problem of a faulty mouse</p> <ol style="list-style-type: none"> 1) Change the mouse surface/use a mousepad 2) Check connection/cable/Bluetooth/ports 3) Restart/reboot the computer 4) Change batteries/Check for battery corrosion 5) Clean optical sensor 6) Re-install the driver/unpair and re-pair Bluetooth mouse 7) Check if the mouse receiver is working, e.g. wireless mouse dongle <p style="text-align: right;">✓✓ (Any two)</p>		2

4.11	<i>TWO kinds of metadata information</i> 1) Author/Who last modified 2) Dates/Time created/modified 3) Geographic location 4) File size 5) Revision number 6) Attributes 7) Number of pages/words 8) Valid descriptive data related to video or audio file <p style="text-align: right;">✓✓ (Any two)</p>		2
4.12	<i>Purpose of a QR code</i> Quick access/link to information, ✓ e.g. URL, videos, network password, text, business card, etc.		1
			[25]

QUESTION 5: INTERNET AND NETWORK TECHNOLOGIES

5.1	<p>Type of internet connection recommended for a school AND motivation</p> <table border="1" data-bbox="300 394 1225 936"> <thead> <tr> <th data-bbox="300 394 571 477">Type of internet connection ✓</th> <th data-bbox="571 394 1225 477">Motivation ✓</th> </tr> </thead> <tbody> <tr> <td data-bbox="300 477 571 560">Cellular (4G/LTE/5G)</td> <td data-bbox="571 477 1225 560">1) High speed internet access 2) Only option available in an area</td> </tr> <tr> <td data-bbox="300 560 571 611">Wireless/WiMAX</td> <td data-bbox="571 560 1225 611">1) High speed internet access</td> </tr> <tr> <td data-bbox="300 611 571 730">Fibre</td> <td data-bbox="571 611 1225 730">1) High speed internet access 2) Cost effective internet access 3) Reliable/stable</td> </tr> <tr> <td data-bbox="300 730 571 813">Satellite</td> <td data-bbox="571 730 1225 813">1) High speed internet access 2) Available in rural areas</td> </tr> <tr> <td data-bbox="300 813 571 936">ADSL</td> <td data-bbox="571 813 1225 936">1) Cost effective internet access 2) Available in an area 3) Reliable</td> </tr> </tbody> </table>	Type of internet connection ✓	Motivation ✓	Cellular (4G/LTE/5G)	1) High speed internet access 2) Only option available in an area	Wireless/WiMAX	1) High speed internet access	Fibre	1) High speed internet access 2) Cost effective internet access 3) Reliable/stable	Satellite	1) High speed internet access 2) Available in rural areas	ADSL	1) Cost effective internet access 2) Available in an area 3) Reliable	2	
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Satellite	1) High speed internet access 2) Available in rural areas														
ADSL	1) Cost effective internet access 2) Available in an area 3) Reliable														
5.2	<p>Advantage of using https protocol over http protocol</p> <p>Https indicates that the website is secure/encrypted ✓</p>	1	3												
5.3	<p>TWO ways software can be used to protect a network from unauthorised users</p> <p>1) Use a firewall 2) Set up access rights/logins for authorised users (username and password) 3) Use data encryption</p> <p style="text-align: right;">✓✓ (Any two)</p>		2												
5.4	<p>TWO reasons why a podcast is preferred over reading a document</p> <p>1) For visually impaired people/special needs/physical disabilities 2) To learn pronunciation of words 3) Some people learn better through audio means 4) Many people multi-task when listening to a podcast, e.g. wear earphones while jogging 5) User can control the listening speed, etc.</p> <p style="text-align: right;">✓✓ (Any two)</p>		2												
5.5	<p>TWO ways to connect more than four devices to this router</p> <p>1) Add a wireless connection/Access Point ✓ 2) Add a switch ✓</p>		2												

5.6	<p><i>TWO reasons why internet access is important to users</i></p> <ol style="list-style-type: none"> 1) Search for information 2) E-learning 3) Use social media 4) Internet services, e.g. financial services, etc. 5) Software updates for latest features 6) Cloud computing/storage 7) Collaboration/Communication between users 8) Working from home 9) Entertainment/streaming/gaming <p style="text-align: right;">✓✓ (Any two)</p>		2
5.7	<p><i>TWO advantages of using a VPN</i></p> <ol style="list-style-type: none"> 1) Secure connection to a network/internet/application 2) Can virtually change your geographic location 3) Provides privacy by masking your IP address 4) Provide simultaneous access to multiple users and remote users <p style="text-align: right;">✓✓ (Any two)</p>		2
5.8	<p><i>TWO ways to resolve the problem when not able to connect to a computer network</i></p> <ol style="list-style-type: none"> 1) Check network cable connection 2) Check for flashing lights on the switch/router and the ports 3) Restart the PC/router/switch 4) Log out, log in 5) Check network adaptor settings 6) Check whether network adaptor is enabled 7) Check if the wireless network has reached the maximum connected devices 8) Disable the airplane mode on the device 9) Check power supply to all devices 10) Check username and password 11) Network administrator updates/creates profile <p style="text-align: right;">✓✓ (Any two)</p>		2
			[15]

QUESTION 6: INFORMATION MANAGEMENT

6.1	Question is suitable/unsuitable for questionnaire AND reason			4
	Question 1	Reason		
	Unsuitable ✓	1) Answer can be found elsewhere 2) Too open-ended for a questionnaire ✓ (Any one)		
	Question 2	Reason		
	Suitable ✓	1) Information cannot be found in other sources 2) Only two options possible, e.g. Yes/No 3) Data can be processed electronically/Closed question ✓ (Any one)		
6.2.1	What makes this author trustworthy? The author/editor is associated/has credentials with a renowned university ✓		1	
6.2.2	How to check if the given information is accurate 1) Check/Verify other sources with similar information 2) Ask an expert in the field ✓ (Any one)		1	2
6.3	TWO word processing features to reference a source 1) Bibliography 2) Citation 3) Footnotes/Endnotes 4) Captions ✓✓ (Any two)			2
6.4.1	ONE reason for using a pie chart 1) All portions of the whole 2) When the total of the numbers is 100% 3) When there are only a few categories/not too many categories/easier to understand ✓ (Any one)		1	
6.4.2	ONE reason for using a line chart 1) Displays trends/changes over time (years, months, days) 2) Used when the order of the categories is important 3) Used when there are many data points ✓ (Any one)		1	2
				[10]

QUESTION 7: SOCIAL IMPLICATIONS

<p>7.1</p>	<p>ONE example of an intellectual property product/(creation)</p> <ul style="list-style-type: none"> 1) Music 2) Software 3) Art 4) Books 5) Design/Industrial design 6) Podcast etc. <p style="text-align: right;">✓ (Any one)</p> <p><i>(Note to marker: Accept one specific intangible example, e.g. Photograph)</i></p>		<p>1</p>
<p>7.2</p>	<p>TWO guidelines that can be found in BYOD policy</p> <ul style="list-style-type: none"> 1) Install an antivirus program 2) Use legal/approved software 3) Do not store sensitive/personal information 4) School has the right to install software on your device 5) Limitation placed on data usage 6) Prescribe times for network connection/device usage 7) School information should be encrypted 8) Limitation on using social media/software/school resources 9) Conform to required hardware specifications 10) Ensure devices are fully functional 11) School does not accept liability for loss or theft 12) School reserves the right to disconnect/disable devices <p style="text-align: right;">✓✓ (Any two)</p>		<p>2</p>
<p>7.3</p>	<p>TWO ways to prevent computer hardware theft</p> <ul style="list-style-type: none"> 1) Install security gates and burglar bars 2) Limit access/employ security companies/guards 3) Install security cameras 4) Install alarm systems 5) Biometric security for entry into the computer lab 6) Place devices in a strong room/safe 7) Secure computers to the desk or floor, e.g. Kensington lock 8) Attach a security device to computers e.g. RFID tags <p style="text-align: right;">✓✓ (Any two)</p>		<p>2</p>

<p>7.4</p>	<p>TWO ways to protect your privacy when using a public hotspot</p> <ol style="list-style-type: none"> 1) Do not perform financial transactions 2) Do not give out/enter personal information/Do not share data over network 3) Do not login to any apps that have your sensitive information 4) Ensure that nobody is looking at your screen/shoulder surfing 5) Use a VPN/Incognito mode <p style="text-align: right;">✓✓ (Any two)</p>		<p>2</p>
<p>7.5</p>	<p>ONE reason why companies may NOT allow employees to telecommute</p> <ol style="list-style-type: none"> 1) Security of sensitive information 2) Cannot easily measure their performance/productivity when employees are not in the office/Too many distractions at home 3) Costly to set up work infrastructure/resources at the office and at the homes of employees 4) Job description requires physical presence 5) Eliminate professional isolation/Encourages teamwork <p style="text-align: right;">✓ (Any one)</p>		<p>1</p>
<p>7.6</p>	<p>TWO negative effects a user can experience if they overuse social media</p> <ol style="list-style-type: none"> 1) Lack of social interaction/Person becomes anti-social 2) Can become addicted to social media/Neglects important work 3) Addictive behaviour can lead to depression/Body dysmorphia 4) Could affect the normal development of children/Could lead to low self-esteem 5) High data usage may lead to financial strain 6) More likely to become a victim of online harassment/cyberbullying, etc. <p style="text-align: right;">✓✓ (Any two)</p> <p><i>(Note to marker: Do NOT accept any reference to lack of physical activity)</i></p>		<p>2</p>
			<p>[10]</p>

QUESTION 8: SOLUTION DEVELOPMENT

8.1	Purpose of a bookmark in a word processing document Quickly links/navigates to different locations in the document ✓		1
8.2	Prepare headings to appear in an automatic table of contents Apply styles to the headings ✓ (Accept if steps are given)		1
8.3.1	Appropriate size of the sName field Any size between 2 and 50 ✓	1	
8.3.2	Appropriate field for a primary key SA_ID ✓	1	
8.3.3	Data type for Gender field to select appropriate option 1) Boolean (Yes/No) 2) Short text (Combo box/Drop-down list/Lookup wizard) ✓ (Any one)	1	
8.3.4	Field property used to automatically insert data Default value ✓	1	
8.4	Database feature to retrieve all records ending in '.com' in a query Use a wildcard ✓ / *.com / Like "*.com"		1
8.5	Spreadsheet feature to copy results without the formula Paste Special ✓ / Paste values		1
8.6.1	Spreadsheet function to return the next whole number in column C ROUNDUP ✓	1	
8.6.2	Reason for '0' displaying in cell C6 Circular reference ✓ / C6 is in the formula/B6=0	1	
8.6.3	Spreadsheet function to determine the number of learners COUNT ✓ / COUNTA / COUNTIF	1	

8.7	<p>Illustrate the display of the web page</p> <div data-bbox="502 291 1069 689" style="border: 1px solid black; padding: 10px;"><p>Shopping List</p><ul style="list-style-type: none">• Butter• Eggs• Flour<p>20. Soap 21. Shampoo 22. Toothpaste</p></div> <p>1) 1 mark for the heading ✓ 2) 1 mark for the first unordered/bulleted list ✓ 3) 1 mark for second ordered/numbered list ✓ 4) 1 mark for illustration of the web page ✓</p>		4
			[15]

TOTAL SECTION B: [75]

SECTION C**QUESTION 9: INTEGRATED SCENARIO**

9.1.1	<p>Missing computer specifications</p> <table border="1" data-bbox="300 448 1225 680"> <thead> <tr> <th colspan="2" data-bbox="300 448 1225 506">Computer Specifications</th> </tr> </thead> <tbody> <tr> <td data-bbox="300 506 874 562">(a) CPU ✓ /Processor</td> <td data-bbox="874 506 1225 562">Celeron</td> </tr> <tr> <td data-bbox="300 562 874 618">Storage device</td> <td data-bbox="874 562 1225 618">(b) SSD/HDD ✓</td> </tr> <tr> <td data-bbox="300 618 874 680">(c) Wi-Fi (connectivity) standard ✓</td> <td data-bbox="874 618 1225 680">802.11</td> </tr> </tbody> </table>	Computer Specifications		(a) CPU ✓ /Processor	Celeron	Storage device	(b) SSD/HDD ✓	(c) Wi-Fi (connectivity) standard ✓	802.11	3	
Computer Specifications											
(a) CPU ✓ /Processor	Celeron										
Storage device	(b) SSD/HDD ✓										
(c) Wi-Fi (connectivity) standard ✓	802.11										
9.1.2	<p>ONE reason why tablets are preferred for registration</p> <p>1) Portability, e.g. lighter, smaller, etc. 2) Battery power during power outages</p> <p style="text-align: right;">✓ (Any one)</p>	1									
9.1.3	<p>Voice recognition software for registration</p> <table border="1" data-bbox="300 1016 1225 1319"> <thead> <tr> <th data-bbox="300 1016 759 1066">Motivation for</th> <th data-bbox="759 1016 1225 1066">Motivation against</th> </tr> </thead> <tbody> <tr> <td data-bbox="300 1066 759 1319"> 1) Faster data capture 2) No need for a mouse or keyboard ✓ (Any one) </td> <td data-bbox="759 1066 1225 1319"> 1) Background noise 2) Spelling recognition of names and surnames is less accurate/Voice recognition training is required ✓ (Any one) </td> </tr> </tbody> </table>	Motivation for	Motivation against	1) Faster data capture 2) No need for a mouse or keyboard ✓ (Any one)	1) Background noise 2) Spelling recognition of names and surnames is less accurate/Voice recognition training is required ✓ (Any one)	2	6				
Motivation for	Motivation against										
1) Faster data capture 2) No need for a mouse or keyboard ✓ (Any one)	1) Background noise 2) Spelling recognition of names and surnames is less accurate/Voice recognition training is required ✓ (Any one)										
9.2	<p>TWO reasons for using online storage for fundraising data</p> <p>1) Data can be accessed from anywhere with internet connection 2) Easier to collaboration/share data 3) No need to use local storage space/save space/easily scalable 4) Interface can be easily customised 5) Better data security in the cloud</p> <p style="text-align: right;">✓✓ (Any two)</p>		2								

9.3	<p>ONE reason for link opening an unexpected website AND solution</p> <p>Reason</p> <ol style="list-style-type: none"> 1) Click-jacking 2) Pharming 3) Malware infection <p style="text-align: right;">✓ (Any one)</p> <p><i>(Note to marker: Accept any valid explanation)</i></p> <p>Solution</p> <p>Install/Update anti-virus/anti-malware ✓</p>		2
9.4.1	<p>TWO spreadsheet features to minimise data capture errors</p> <ol style="list-style-type: none"> 1) Data validation 2) Conditional formatting 3) Combo box/Drop-down list from Developer Tab 4) Comment giving guidance 5) Set cells/columns to certain data types 6) Date Picker 7) Use Freeze Panes <p style="text-align: right;">✓✓ (Any two)</p>		2
9.4.2	<p>TWO methods possibly used to display values in column C</p> <ol style="list-style-type: none"> 1) VLOOKUP / LOOKUP / HLOOKUP / XLOOKUP function 2) Import/Export data 3) Functions over two worksheets <p style="text-align: right;">✓✓ (Any two)</p> <p><i>(Note to marker: Accept any specific method/description)</i></p>		2
9.4.3	<p>Formatting that can make the worksheet more user-friendly</p> <ol style="list-style-type: none"> 1) Merge cells for the heading/Wrap text 2) Currency symbol for column D 3) Use of colours/Shading/Cell styles 4) Use of different fonts/font sizes/border line thicknesses, etc. <p style="text-align: right;">✓✓ (Any two)</p>		2
9.5	<p>TWO ways to use ICTs to distribute documents for the talent show</p> <ol style="list-style-type: none"> 1) Send electronic tickets/programmes/roster to smartphones via IM/SMS/MMS 2) Use social media/school website to advertise 3) Communicate via WhatsApp/D6 App/QR code 4) E-mail tickets/receipts to people 5) Download a digital programme – no printing <p style="text-align: right;">✓✓ (Any two)</p>		2

9.6	<p>TWO advantages of using online forms for a voting system</p> <ol style="list-style-type: none"> 1) Data capture is immediate 2) Data is available in a spreadsheet automatically 3) Graphs are created automatically 4) Functions and formulae can be used to determine scores/winners 5) Can be set to allow only one vote per person 6) Paperless/Environmentally friendly 7) Can vote from anywhere/no queues <p style="text-align: right;">✓✓ (Any two)</p>			2
9.7	<p>TWO advantages of printing the trophies with a 3D printer</p> <ol style="list-style-type: none"> 1) Can be cheaper than other manufacturing methods ✓ 2) Trophies can be customised ✓ 			2
9.8.1	<p>ONE possible problem using a smartphone for night-time photographs</p> <ol style="list-style-type: none"> 1) Faster battery depletion due to use of the flash 2) Poorer image quality due to poor/insufficient lighting 3) Photographs have to be taken from a shorter distance, etc. <p style="text-align: right;">✓ (Any one)</p>			1
9.8.2	<p>TWO guidelines to follow before posting pictures to social media</p> <ol style="list-style-type: none"> 1) Ask for permission before posting 2) Do not post pictures of minors 3) Do not post sensitive/inappropriate pictures of people, 4) Do not post pictures for malicious purposes, etc. <p style="text-align: right;">✓✓ (Any two)</p>			2
				3
				[25]

QUESTION 10: INTEGRATED SCENARIO

10.1	<p>Reason why institution may not be able to upgrade their laptops</p> <p>1) Laptops are too old for a cost effective upgrade 2) New parts are not compatible/Compatible parts are not available 3) Hardware specifications do not allow for software upgrade 4) Institution does not have budget for upgrade</p> <p style="text-align: right;">✓ (Any one)</p>		1
10.2.1	<p>Definition of broadband</p> <p>A high-speed internet connection ✓ with wide bandwidth ✓ / that is always on</p>	2	
10.2.2	<p>Unit of measurement for data transmission speed</p> <p>bits ✓ / Mb / Megabits (per second) / Mbps</p>	1	
10.2.3	<p>Effect of throttling on users while doing online learning</p> <p>1) Video/Audio feeds will buffer/lagging 2) Resources may take long to download 3) Tasks cannot be completed on time/Access to services times out</p> <p style="text-align: right;">✓ (Any one)</p>	1	4
10.3	<p>TWO disadvantages of video conferencing</p> <p>1) Requires fast internet connection 2) Consumes a lot of data when using video/Depletes cap quickly 3) Lack of physical face-to-face contact</p> <p style="text-align: right;">✓✓ (Any two)</p>		2

10.4.1	<p>Keylogger threat to online privacy and security</p> <p>Gain access to user names and passwords ✓ to commit fraud/identity theft/hacking/access to information ✓</p>	2	
10.4.2	<p>TWO advantages of two-factor authentication for the user</p> <p>1) Offers more security for accounts/financial transactions 2) Even if your password is compromised, second step prevents access 3) You will be alerted to attempts to access your account</p> <p>✓✓ (Any two)</p>	2	
10.4.3	<p>TWO examples of web services that use two-factor authentication</p> <p>1) Banking/Financial websites 2) Cloud storage, e.g. OneDrive 3) SaaS, e.g. Microsoft products, Google account 4) E-commerce websites 5) Social media 6) E-mail services, e.g. Yahoo, Gmail, etc.</p> <p>✓✓ (Any two)</p> <p>(Note to marker: Accept any valid specific examples)</p>	2	6
10.5	<p>TWO reasons why e-mails were NOT received</p> <p>1) Inboxes are full 2) E-mail is flagged as spam 3) Service provider blocked the e-mail, e.g. attachment size/type 4) Data depleted 5) No data connection 6) Incorrect e-mail address was used 7) Message still in the sender's outbox/remains unsent, etc.</p> <p>✓✓ (Any two)</p>		2
10.6.1	<p>Benefit of an add-on</p> <p>Adds additional functionality ✓ to a browser/application</p>	1	
10.6.2	<p>Example of add-ons</p> <p>1) PrintFriendly 2) Ad blocker 3) Pop-up blocker, etc.</p> <p>✓ (Any one)</p> <p>(Note to marker: Accept any valid example or brand name of an add-on)</p>	1	2

10.7	Concept of augmented reality (Takes physical world and) adds/overlays objects/graphics ✓ (on a digital interface) within the real world		1
10.8	Advantages of online learning for the learner 1) Accessible any time any place/flexible mode of learning 2) Personalised learning – select parts of a lesson/repeat or view previous lessons 3) Do not have to waste time and money travelling to an institution 4) Safer learning environment, especially during a pandemic 5) Access to teachers/subjects not available at your school, etc. ✓✓ (Any two)		2
10.9	Application that opens PDF files other than PDF reader Web browser ✓ (Note to marker: Accept any specific example of a web browser, e.g. Microsoft Edge)		1
10.10.1	Reason why the title does not display in the web browser tab There is no title closing tag ✓ /Two opening title tags	1	2
10.10.2	Number of columns in the first row of the web page 1 ✓	1	
10.11	TWO ways to ensure that an image fully visible 1) Specify the dimensions of the picture in the image tag 2) Change viewing percentage on the browser 3) Resize the original image/Stretch/Make the image smaller/bigger ✓✓ (Any two)		2
			[25]

TOTAL SECTION C: [50]

GRAND TOTAL: 150