

# COMPUTER STUDIES

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6134  
Paper 1

## General Comments

- *Candidates demonstrated a good level of knowledge about the fundamental aspects of computer science. Candidates are encouraged to consider the context given in some questions instead of giving general answers. Candidates should look to reflect the application of this context in the knowledge and understanding they are required to demonstrate. This would allow candidates to show a greater understanding beyond a general response about the topic in question, thereby allowing room for scoring more marks.*
- *Misinterpretation of questions is still a common challenge that teachers still need to help candidates address. Before answering, reading and understanding questions will help the candidates overcome this hurdle.*
- *Most candidates expressed themselves better by avoiding one-word answers in questions where explanations, descriptions, reasons etc., were expected. This approach helped examiners to gauge candidates' work better.*
- *The layout and presentation of work were well organised and neat for most candidates.*
- *Teachers are encouraged to desist from selective teaching. Similarly, candidates are advised to stop selective learning. All aspects of the syllabus are essential and are examinable.*
- *Candidates should still be encouraged to attempt all questions and avoid leaving gaps or unanswered questions.*
- *Candidates are reminded to make sure they do not write outside the given writing space in a question. If additional writing space is required, candidates should use the other pages available. They should make sure they indicate the question for which they provide the response.*

### 1 *The majority of candidates were better prepared for this question.*

*1 mark for each correct answer, maximum 4 marks*  
graph plotter  
speaker  
3D printer  
screen

### 2 (a) *Generally well answered question although only the really top candidates scored full marks.*

*1 mark for two correct answers, maximum 2 marks*  
- True  
- False  
- True  
- True

### (b) *Most candidates did not know what cache memory is. It was a common mistake for candidates to describe RAM instead.*

- (i) *1 mark for each correct point, maximum 2 marks*
- *A small block of very high speed memory*
  - *acting as a buffer*
  - *between the CPU and main memory*
  - *stores data / instructions which are used frequently by the CPU*
- (ii) *1 mark per correct point, maximum 2 marks*
- *So the CPU does not have to access the main memory...*
  - *Which is slower than cache*

3 **A sensor is an input device. Actuators control environmental conditions. A sizeable number of candidates were confusing the role of a sensor and that of an actuator.**

(a) 1 mark for each correct point, maximum 2

- It is an input device
- It measures/takes (physical) readings of the surrounding/environment for example/physical properties

(b) 1 mark for each sensor, Maximum 3 marks

1 mark for each use, Use must match sensor given Maximum 3 marks:

**Humidity/Moisture (sensor)**

- To measure the water content of the soil
- To alert when the soil is too dry or too wet/needs watering

**pH (sensor)**

- To measure how acidic/alkaline the soil is
- To alert when there may be something polluting the soil

**Light (sensor)**

- To measure the brightness of the environment
- To alert when the fruit has too little/too much light

**Temperature (sensor)**

- To measure the temperature of the environment
- To alert when it is too hot/too cold for the fruit to grow

**Gas (sensor)**

- To measure the amount of CO<sub>2</sub>/oxygen present
- To alert when too much CO<sub>2</sub>/oxygen present

**Humidity (sensor)**

- To measure the water content in the air
- To alert when the air is too dry

**Infra-red / motion (sensor)**

- To measure level of infra-red/microwaves deflected
- To alert to any intruders e.g. animals stealing the fruit

(c) 1 mark per correct drawback, maximum 2 marks

- faulty sensor can cause incorrect results
- can be costly to implement or replace
- give incorrect results if setup is incorrect
- some types have distance limitations
- may not work without power source

4 (a) **Candidates should desist from parroting terms that they are being asked about as it does not demonstrate any computer science skill(s), subject understanding or knowledge. In many instances, the words wide, area and network were given back to the examiners in different fashions. Such responses are not credit-worthy.**

1 mark for each correct point, maximum 2 marks

- Accept responses such as the company doesn't own the infrastructure
- Do not accept 'Network over a wide area' or similar arrangement of wording
- The computers are geographically remote/ distanced/ more than a mile apart
- Communication medium is not owned by the law firm

- (b) **A sizeable number of candidates showed a good grasp of the cloud computing concepts being examined in this question. Only the top candidates managed to describe the economic impacts on the marketing firm. In order to score full marks, candidates are encouraged to fully read and understand the question as well as referencing the context instead of giving general and or incomplete responses.**

Correct identification of service 1 mark, maximum 3

Identification of impact 1 mark, maximum 3

Economically related to the marketing form 1 mark, maximum 3

Sample answers given, accept any correct answers

- additional storage/scalable storage for clients (1) so the firm can take on more clients (1) and gain more revenue (1)
- backing up data (1) a regular task that takes up staff time/needs hardware (1) and so saves the firm time/money (1)
- off-site data storage (1) would allow their employees to work from anywhere (1) therefore save on infrastructure (1)
- the third party provides security (1) a regular task that takes up staff time and requires higher order expertise (1) will better secure the firm's data at competitive costs ( saves time/money) (1)

Also accept:

- **IaaS** (Infrastructure as a Service) (1) self-service for accessing and monitoring computers, networking, storage and other services (1) allows for purchase of resources on demand (1) instead of outright purchase (1) ...cost effective to the firm
- **PaaS** (Platform as a Service) (1) facilitates software creation for marketing firm developers (1) firm focuses on actual app development // software development team becomes more productive // streamlining work flows especially for multiple developers (teams, both internal or external) (1) cutting on unnecessary costs or unproductive efforts (1)
- **SaaS** (Software as a Service) Cloud application services (1) managed by third party vendors (1) less burden on software deployment and management (e.g. updating etc.) for technical staff (1) thereby cutting costs or focusing on more processing issues

- 5 (a) **Generally well answered.**

1 mark per correct tick, maximum 2

	tick (✓)
Control unit	
Graphics program	
Inference engine	✓
RFID	
Rules base	✓
Search engine	

- (b) **Expert systems augment the knowledge of a human doctor but cannot replace the human doctor. Some candidates reflected the fallacy that expert systems act as additional doctors, thereby could work in place of a human doctor. Candidates also needed to describe the benefits more than giving one-word answers or general responses.**

Any three from, maximum 3 marks

- An expert system may help the doctor make a more accurate diagnosis
- An expert system uses data from many experts therefore it contains more knowledge than a single doctor
- Cheaper than regularly re-training the doctor
- The expert system's knowledge may be more up to date than the knowledge of a single doctor
- Cheaper than employing many specialist
- The diagnoses given are more consistent

- (c) 1 mark per correct point, maximum 2 marks

- fault diagnosis (e.g. car engines, electronic devices)
- geological surveys
- Classification e.g. plant or animal classification
- Monitoring e.g. compare data from a continually observed system to prescribe behavior e.g. studying virus behavior
- Process control e.g. controlling a physical process based on monitoring
- Design e.g. configure a system according to specifications
- Scheduling and planning – develop or modify a plan of action
- Generation of options – identify and provide alternative solutions to problem

**6 This question was generally well answered.**

(a) 1 mark for each correct answer, maximum 4 marks

(i) decimal

(ii) boolean

(iii) integer

(iv) currency

(b) (i) 1 mark per correct answer, maximum 2 marks

**TotalCost = 11**

**RunningCost=N\$12.95**

(ii) 1 mark per correct answer, maximum 2 marks

**TotalCost = 11**

**RunningCost=N\$13.65**

*Also accept*

**TotalCost=12**

**RunningCost=N\$13.70**

**7 1 mark for name of method + 1 mark for corresponding benefit , maximum 6 marks**

**emails:**

- fast delivery of messages (to recipient's mail box) – able to send attachments
- can store messages for later use
- auto-translation no language problems – can open email at a convenient time

**video conferencing/calling/chat:**

- removes need to travel (saves time and money)
- allows face to face discussions
- works in real time (only allow once)

**VoIP:**

- much cheaper than normal international calls
- direct communication between people
- works in real time (only allow once)

**Chat rooms/instant messaging:**

- instantaneous reply
- anyone can join in

**social networking:**

- can ensure only your "friends" are in communication
- usually free to join and use
- talk to (multiple) friends at the same time

*Also accept SMS / Short Message Service // DM / Direct Message*

**8 Teachers are encouraged to provide hands-on exposure to concepts covered in this topic as it provides more meaning to candidates. Such meaning is reflected positively in their responses. The importance of selecting cells first before copying or formatting cells is necessary and needed to be mentioned in a(iii) and b(i).**

**(a) (i)** Two marks for:

=SUM(B5:B8)

Marks to be awarded as follows:

=SUM() 1 mark

all correct range if using SUM i.e. B5:B8 1 mark

or:

All correct as follows:

=B5+B6+B7+B8 2 marks

**(ii)** Two from:

=AVERAGE() 1 mark

all correct range () i.e. B5:B8 or B5,B6,B7,B8 1 mark

or:

=SUM(B5:B8) /4 2 marks

or:

=B10 /4 2 marks

or:

range must be all correct

=(B5+B6+B7+B8) must be all correct, including the () /4 2 marks

**(iii)** One description from:

- copy and paste (1) formula/contents of cell B10 (1) into cells C10 to E10 (1)
- select/replicate cell B10 (1) by drag bottom right corner of cell/black cross (1) across/(to the right) over cells C10 to E10 (1)
- fill right (1) from B10 (1) across C10 to E10(1)

*The methods are:*

- copy and paste
- select, drag bottom right corner across

*Allow one description along with the correct cell references.*

*Must have both copy and paste for the mark.*

**(b) (i)** Four from:

- Cells F3 and F4 (1) merged (1)
- contents centered (1) horizontally and vertically(1)
- contents emboldened (1)
- wrap text (1)
- enlarged the cell vertically/increased vertical height of cell (1)

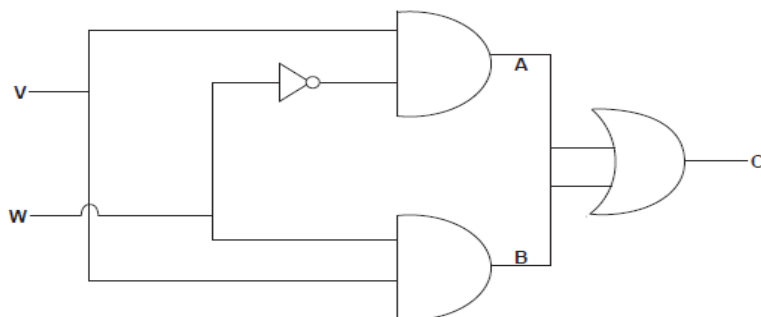
**(ii)** One explanation from:

- values are more meaningful (1) because people are always whole numbers/not fractions or decimal places (1)
- whole numbers are easier to comprehend (1) so information is conveyed better (1)

- 9 (a) *There was a noticeable improvement in the way this topic was answered this time around in comparison to yester years. Candidates from some centres struggled to draw a logic circuit from a logic statement.*

1 mark for each correct logic gate with correct order, maximum 4.

Ignore A & B when awarding marks.



- (b) 1 mark for correct 2 rows, maximum 2, 1 mark for 2 or 3 correct outputs.

Ignore working column when awarding marks.

		Working				
V	W	NOT W	A	B	X	
0	0	1	0	0	0	
0	1	0	0	0	0	
1	0	1	1	0	1	
1	1	0	0	1	1	

- (c) 1 mark for correct answer

**Register Z**

- 10 (a) *Generally, a well-answered question, although a sizeable number, failed to score full marks as they overlooked the fact that other methods besides interviews were being solicited.*

1 mark per correct point, maximum 3 marks

- Observation
- Questionnaire / Survey
- Examination of documents

- (b) *Any two matched pairs, maximum 4 marks*

- The interviewee may be uneasy with the questioning  
...as it is not anonymous
- Time consuming to interview all the users  
...the interviews are carried out one at a time
- Both the interviewee and the interviewer have to be free at the same time  
...which can cause time problems
- May be a language problem  
...this increases the time explaining all sections
- May give an answer they think the interviewer is trying to elicit  
...the interviews could be biased/leading questions
- Disillusioned workers may give an answer that jeopardises the project  
...they could give a biased view/too vocal
- They cannot give the answer they want  
...as the interview is not anonymous/due to peer pressure

- Costly to the employers  
...time for the worker being off job

11 (a) 1 mark per point, maximum 2 marks

- A set of data ...
- ... organised ...
- ... as a set of records...
- ... in one or more files.

(b) 1 mark per point, maximum 2 marks

- Primary key: ChannelID
- It is a unique identifier/Two channels can have the same ChannelName but they cannot have the same ChannelID

(c) **A sizeable number of candidates struggled with this question. More practical activities are needed to help candidates master the concept of writing meaningful query conditions.**

1 mark for:

Display ChannelID and ChannelName

Where

1 mark for:

ChannelType = "Movies" AND HD="True"

Also accept ChannelType = "Movies" AND HD = 1

12 1 mark for correctly completed row, maximum 5

Hexadecimal instruction	Binary instruction	Operation
<b>6</b>	0110	Right
<b>F</b>	1111	Up
<b>C</b>	1100	Open
<b>3</b>	0011	Close
<b>1</b>	0001	Down

13 **There were improved responses to the algorithm question this year. Candidates are encouraged to make an attempt to the question. Marks are awarded per attempted marking point rather than for a perfect solution.**

1 mark per bullet, maximum 6 marks

- MP1** Initialisation of Gina, Monica and Tangi as zero.
- MP2** Allows input (of anything) from the user
- MP3** Incrementing Gina, Monica and Tangi depending on input
- MP4** Repeats bullet points 2 and 3
- MP5** ...stopping only when "END" is entered
- MP6** Prints out all 3 individual counts and prints calculated total count

**Example algorithm**

```

ginacount = 0
monicacount = 0
tangicount = 0
vote = ""
while vote != "END"
    vote = input("enter Gina, Monica and Tangi")
    if vote == "Gina" then
        ginacount = ginacount + 1
    elseif vote == "Monica" then
        monicacount = monicacount + 1
    elseif vote == "Tangi" then
        tangicount = tangicount + 1
    end if
endwhile
print ginacount
print monicacount
print tangicount
print ginacount + monicacount + tangicount

```

*Do not penalise for missing initialisation of variable used in the while loop or total (if used)*

*Comparison with value inputted MUST be a string (e.g. if vote == Gina) is incorrect as Gina here is a variable, not a string.*

*Answer can be any recognised algorithm – pseudocode, flowcharts, structured English, etc. Mark on whether the bullet points on the left hand side have been met. Does not have to match algorithm above.*

*4th bullet point (repeat) can be given for any sensible attempt at iteration.*

*Use professional judgement on where loops end (WHILE / END WHILE or indentation).*

- 14 (a) The majority of the candidates struggled to describe hardware tokens. Teachers are encouraged to desist from selective teaching. Candidates are also encouraged to desist from selective learning. All learning objectives stipulated In the syllabus should be taught and learned.**

*1 mark per point on OTP, maximum 2 marks*

- stands for one time pin or password
- it is a dynamic password
- only valid for one login session
- ...normally valid for a short duration

*1 mark per point on hardware token, maximum 2 marks*

- authenticator in the form of a physical object
- used to prove that user physically possesses the object
- users may be required to type a pseudo-random number generated by token into login

- (b) 1 mark for correct security measure**

- software token
- virtual token
- security token
- PUK
- PIN

*Also accept*

Biometric security //Facial recognition//Fingerprint etc

Encryption

Firewall