OCR
Oxford Cambridge and RSA

Practice Paper

GCSE (9-1) Computer Science
J276/01 Computer Systems

MARK SCHEME

Duration: 1 hour 30 minutes

MAXIMUM MARK 80

Version:
Last updated:

(FOR OFFICE USE ONLY)

MARKING INSTRUCTIONS

PREPARATION FOR MARKING
SCORIS

1. Make sure that you have accessed and completed the relevant training packages for on-screen marking: *scoris assessor Online Training*; *OCR Essential Guide to Marking*.

2. Make sure that you have read and understood the mark scheme and the question paper for this unit. These are posted on the RM Cambridge Assessment Support Portal http://www.rm.com/support/ca

3. Log-in to scoris and mark the **required number** of practice responses ("scripts") and the **number of required** standardisation responses.

   YOU MUST MARK 10 PRACTICE AND 10 STANDARDISATION RESPONSES BEFORE YOU CAN BE APPROVED TO MARK LIVE SCRIPTS.

MARKING

1. Mark strictly to the mark scheme.

2. Marks awarded must relate directly to the marking criteria.

3. The schedule of dates is very important. It is essential that you meet the scoris 50% and 100% (traditional 40% Batch 1 and 100% Batch 2) deadlines. If you experience problems, you must contact your Team Leader (Supervisor) without delay.

4. If you are in any doubt about applying the mark scheme, consult your Team Leader by telephone or the scoris messaging system, or by email.

5. Work crossed out:
   a. where a candidate crosses out an answer and provides an alternative response, the crossed out response is not marked and gains no marks
   b. if a candidate crosses out an answer to a whole question and makes no second attempt, and if the inclusion of the answer does not cause a rubric infringement, the assessor should attempt to mark the crossed out answer and award marks appropriately.

6. Always check the pages (and additional objects if present) at the end of the response in case any answers have been continued there. If the candidate has continued an answer there then add a tick to confirm that the work has been seen.

7. There is a NR (No Response) option. Award NR (No Response)
   - if there is nothing written at all in the answer space
   - OR if there is a comment which does not in any way relate to the question (eg 'can't do', 'don't know')
   - OR if there is a mark (eg a dash, a question mark) which isn't an attempt at the question

   Note: Award 0 marks – for an attempt that earns no credit (including copying out the question)

8. The scoris **comments box** is used by your team leader to explain the marking of the practice responses. Please refer to these comments when checking your practice responses. **Do not use the comments box for any other reason.**
   If you have any questions or comments for your team leader, use the phone, the scoris messaging system, or e-mail.

9. Assistant Examiners will send a brief report on the performance of candidates to their Team Leader (Supervisor) via email by the end of the marking period. The report should contain notes on particular strengths displayed as well as common errors or weaknesses. Constructive criticism of the question paper/mark scheme is also appreciated.

10. For answers marked by levels of response: Not applicable in F501
    a. **To determine the level** – start at the highest level and work down until you reach the level that matches the answer
    b. **To determine the mark within the level**, consider the following:

Descriptor	**Award mark**
On the borderline of this level and the one below	At bottom of level
Just enough achievement on balance for this level	Above bottom and either below middle or at middle of level (depending on number of marks available)
Meets the criteria but with some slight inconsistency	Above middle and either below top of level or at middle of level (depending on number of marks available)
Consistently meets the criteria for this level	At top of level

11. **Annotations**

Annotation	Meaning
BP	Blank Page – this annotation **must** be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.
^	Omission mark
BOD	Benefit of doubt
C	Subordinate clause/Consequential error
	Cross
E	Expansion of a point
FT	Follow through
NAQ	Not answered question
NBOD	Benefit of doubt not given
P	Point being made
REP	Repeat
	Slash
	Tick

12. Subject Specific Marking Instructions

LEVELS OF RESPONSE QUESTIONS:
For answers marked by **levels of response**:
• to determine the level – start at the highest level and work down until you reach the level that matches the answer
• to determine the mark within the level, consider the following

The indicative content indicates the expected parameters for candidates' answers, but be prepared to recognise and credit unexpected approaches where they show relevance.

Using 'best-fit', decide first which set of BAND DESCRIPTORS best describes the overall quality of the answer. Once the band is located, adjust the mark concentrating on features of the answer which make it stronger or weaker following the guidelines for refinement*.

Highest mark: If clear evidence of all the qualities in the band descriptors is shown, the HIGHEST Mark should be awarded.

Lowest mark: If the answer shows the candidate to be borderline (i.e. they have achieved all the qualities of the bands below and show limited evidence of meeting the criteria of the band in question) the LOWEST mark should be awarded.

Middle mark: This mark should be used for candidates who are secure in the band. They are not 'borderline' but they have only achieved some of the qualities in the band descriptors.
Be prepared to use the full range of marks. Do not reserve (e.g.) high Band 3 marks 'in case' something turns up of a quality you have not yet seen. If an answer gives clear evidence of the qualities described in the band descriptors, reward appropriately.
*When only two marks are available (low mark band) only use Highest and Lowest mark guidance for 'best-fit'.

	AO2.1a	AO2.1b
High (thorough) (6 – 8 marks)	Precision in the use of terminology. Knowledge shown is consistent and well-developed. Clear appreciation of the question from a range of different perspectives making extensive use of acquired knowledge and principles of computer science.	Understanding of concepts is consistently applied to context enabling a logical and sustained argument to develop. Examples used enhance rather than detract from response.
Middle (reasonable) (3 – 5 marks)	Awareness of the meaning of the terms in the question. Knowledge is sound and effectively demonstrated. Demands of question understood although at times opportunities to make use of acquired knowledge and concepts are not always taken	Understanding of concepts is shown and is applied to context. There is clear evidence that an argument builds and develops through the response but there are times when opportunities are missed to use an example or relate an aspect of understanding to the context provided.
Low (basic) (1 – 2 marks)	Confusion and inability to deconstruct terminology as used in the question. Knowledge partial and superficial. Focus on question narrow and often one-dimensional.	Inability to apply understanding of key concepts in any sustained way to context resulting in tenuous and unsupported statements being made. Examples if used are for the most part irrelevant and unsubstantiated.
0 marks	No response or no response worthy of credit.	No response or no response worthy of credit.

Question	Answer	Mark	Guidance
1ai	1 mark per bullet to max 4 • malicious code entered • …into a website form • to modify / malform the SQL statement that is executed • …resulting in unauthorised access to data / modification of data / deletion of data / insertion of data	4 AO1 1a (2) AO1 1b (2)	Accept other valid entry points for 2nd bullet point (eg querystrings)
1aii	1 mark per bullet to max 2 e.g. • Validation on user input • ..check what has been input into a box does not contain SQL statements / disallowed characters • Escaping input strings… • …indicate (e.g. using /) that characters are to be ignored for processing • Penetration testing • …someone tests for vulnerabilities and reports back/ • Prepared statements / parameterised queries / stored procedures… • …attempt to restrict what SQL can be executed	2 AO2 1a(1) AO2 1b(1)	Accept other sensible answers which attempt to prevent the threat taking place.
1aiii	1 mark for naming, max 2 for description e.g. • Virus • Software that replicates itself • Deletes data // fills hard drive space // slows computer • Denial of service attack • People/software make many requests for data from a webserver • Webserver cannot respond to all requests and crashes • Brute force attack • Discovers passwords / login information	3 AO1 1a (1) AO1 1b (1) AO2 1a (1)	Allow any suitable threat to the website – NB this is not physical means as that is threat to the components not the website

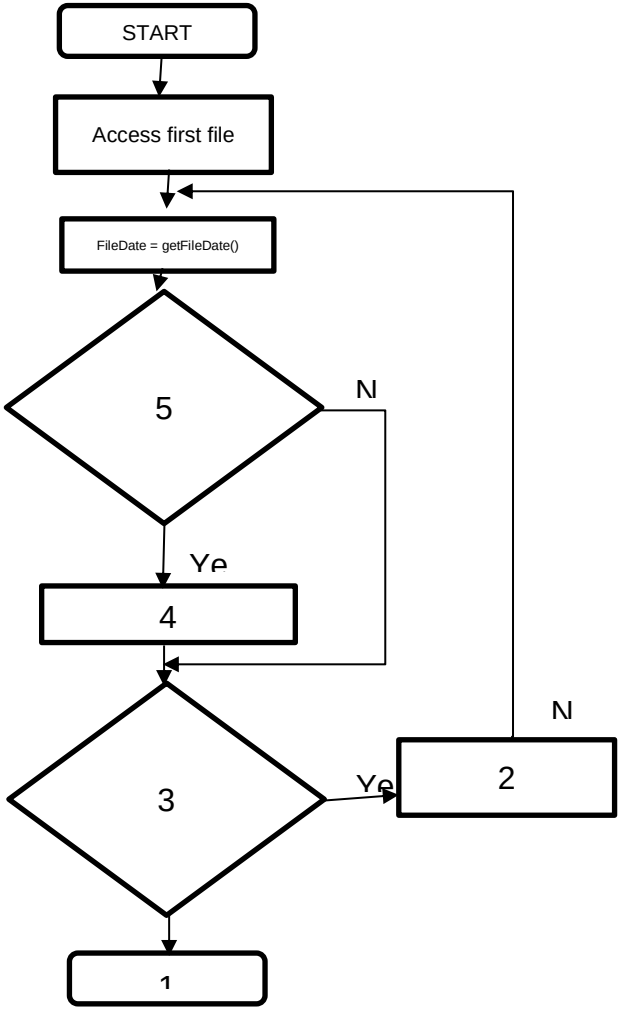
	• By using trial and error / exhaustive effort		
1bi	1 mark per bullet to max 2. Mark in pairs e.g. • URL uses words/characters (*eg http://www.ocr.org.uk*) • IP is numerical (eg.*192.149.119.226*) • URL needs converting (using DNS) to IP before it can be accessed • IP does not require conversion • URL specifies protocol and location (and resource name) • IP specifies address only	2 AO1 1a (2)	Accept examples as long as examples given are correctly formatted.
1bii	Easier to remember	1 AO2 1a(1)	
1ci	1 mark per bullet to max 2 • Small geographical area // same room • Only uses internal hardware // does not use external hardware / telephone lines	2 AO2 1b(2)	
1cii	1 mark per bullet to max 3 • Server connected to all 3 computers • Printer connected directly to server only	3 AO1 1b(1) AO2 1a(2)	
1ciii	1 mark per bullet, max 1 for personal computer, max 1 for server Personal computer • Sends requests to server • shows results from server Server • Processes requests • Manages clients • Centrally stores files / software	2 AO1 1b(2)	

<table>
<tr>
<td>2a</td>
<td>1 mark for each row
<table>
<tr><th>Statement</th><th>MAR memory address register</th><th>MDR memory data register</th><th>PC program counter</th><th>Accumulator</th></tr>
<tr><td>Stores the address of the next instruction to be run</td><td></td><td></td><td>✓</td><td></td></tr>
<tr><td>Stores the address where the next data will be fetched from</td><td>✓</td><td></td><td></td><td></td></tr>
<tr><td>Stores the result of arithmetic calculations</td><td></td><td></td><td></td><td>✓</td></tr>
<tr><td>Is incremented each time an instruction is run</td><td></td><td></td><td>✓</td><td></td></tr>
<tr><td>Stores the data that has just been fetched</td><td></td><td>✓</td><td></td><td></td></tr>
</table>
</td>
<td>5
AO1 1a (5)</td>
<td></td>
</tr>
<tr>
<td>2b</td>
<td>1 mark per bullet to max 2
• Provides timing signals
• Provides control signals
• Sends signals to memory // ALU // I/O devices</td>
<td>2
AO1 1a(2)</td>
<td></td>
</tr>
<tr>
<td>2c</td>
<td>1 mark per bullet to max 3
• Allow user to run programs there is insufficient RAM for
• Move data not recently used to HDD to free up space in RAM
• … to be filled by new data required to be stored in RAM
• Allows her to run more programs simultaneously with less slow down.</td>
<td>3
AO1 1b (1)
AO2 1b (2)</td>
<td></td>
</tr>
<tr>
<td>2d</td>
<td>Mark Band 3–High Level
(6-8 marks)
The candidate demonstrates a thorough knowledge and understanding of a wide range of considerations in relation to the question; the material is generally accurate and detailed.
The candidate is able to apply their knowledge and understanding</td>
<td>8
AO2 1a (4)
AO2 1b (4)</td>
<td>The following is indicative of possible factors/evidence that candidates may refer to but is not prescriptive or exhaustive:
Indicative Content:

<u>More RAM</u></td>
</tr>
</table>

	directly and consistently to the context provided. Evidence/examples will be explicitly relevant to the explanation. The candidate is able to weigh up both sides of the discussion and includes reference to the impact on all areas showing thorough recognition of influencing factors. *There is a well-developed line of reasoning which is clear and logically structured. The information presented is relevant and substantiated.* **Mark Band 2-Mid Level** **(3-5 marks)** The candidate demonstrates reasonable knowledge and understanding of a range of considerations in relation to the question; the material is generally accurate but at times underdeveloped. The candidate is able to apply their knowledge and understanding directly to the context provided although one or two opportunities are missed. Evidence/examples are for the most part implicitly relevant to the explanation. The candidate makes a reasonable attempt to discuss the impact on most areas, showing reasonable recognition of influencing factors. *There is a line of reasoning presented with some structure. The information presented is in the most part relevant and supported by some evidence.* **Mark Band 1-Low Level** **(1-2 marks)** The candidate demonstrates a basic knowledge of considerations with limited understanding shown; the material is basic and contains some inaccuracies. The candidate makes a limited attempt to apply acquired knowledge and understanding to the context provided. The candidate provides nothing more than an unsupported assertion. *The information is basic and communicated in an unstructured way. The information is supported by limited evidence and the relationship to the evidence may not be clear.* **0 marks** No attempt to answer the question or response is not worthy of credit		• More RAM can (temporarily) store more data in faster memory • Allows more programs to be open at once without affecting performance. • More RAM can avoid use of VM • No memory intensive software being used so more RAM may not be required <u>Faster processor</u> • Faster processor allows more tasks to completed per second. • …so software may respond faster • Faster processor allows more instructions to be run per second • …therefore performing more tasks in a specified time / performing a task in a shorter time. • No processor intensive software being run so faster processor may not be required. <u>Solid state drive</u> • Faster access than magnetic drive • Quicker to boot up computer. • Quicker to load programs • Quicker to save / load files. • Even with no intensive software running, speed increase possible.
3a	• Provide an interface between software and hardware / control the hardware.	1 AO1 1a(1)	

3b	1 mark per bullet to max 4. Max 2 for descriptions of memory management not applied to scenario/benefits e.g. • Allocates memory to applications… • …so employees can run more than one piece of software at once. • Removes data (from memory) that is no longer needed… • …to free up memory for the employee's other data / programs • Moves data from RAM to VM / into swap file • …allows user to perform tasks as though the computer had more RAM	4 AO1.1b (2) AO2 1b(2)	
3ci	1 mark for identification, max 2 for description of use e.g. • Encryption software • Encrypt software/files before sending / saving • So if they are accessed they cannot be read / understood • Defragmentation • Move files on the hard drive so free space is collected together • So file access is quicker • Compression software • Reduce the size of files before sending / saving • So they can be transmitted faster // take up less space	3 AO1 1b(1) AO2 1a(1) AO2 1b(1)	

3d	1 mark for 1/2 correct numbers 2 marks for 3 correct numbers 3 marks for 4 correct numbers 4 marks for 5 correct numbers 	4 AO3 2b (2) AO2 1b(2)	

3e	1 mark per bullet to max 4
	• Open the "dates.txt" text file (in write mode)
	• Obtains the last backup date by calling lastBackupDate()
	• ...and writes this out to the text file
	• Closes text file.
		4
		AO3 2b(4)
			Do not penalise capitals in function name
			
			Example pseudocode
			`Myfile = openWrite("dates.txt")`
			`lastdate = lastBackupDate()`
			`Myfile.writeline(lastdate)`
			`Myfile.close()`
			
			Bullet points 2 and 3 can be combined in one line.

4a	No mark for identifying if ethical or unethical. Max 3 for justification Ethical e.g. • She could ask the author for permission • It may be copyright free • She might give credit to the author • May be for personal/education use only (eg to learn from) / not distributed Unethical e.g. • Code may be copyrighted • Would need to get permission before using it • Plagiarism • Denies income / publicity to rightful owner	3 AO2 2b(3)	Candidates can discuss both sides of this (e.g. they could get 2 marks from ethical and 1 mark from unethical, or all 3 marks from unethical). Accept other sensible ethical or unethical issues.
4bi	1 mark per bullet to max 2 e,g, • Other people can improve on the software / add features / maintain • gain a wider range of consumers/users • .. therefore gain reputation • Use for advertising • …gain income from adverts	2 AO2 2b(2)	Do not award mark simply for definition of what open source software is.
4bii	1 mark per bullet to max 2 e.g. • Can sell // receive income • Program can be copyrighted • …retain control over source code / modifications	2 AO2 2b(2)	Do not award mark simply for definition of what proprietary software is.

	• …retain control over distribution		
5a	2 mark per device e.g. • Wireless access point (WAP) • Switch • Hub • Router • Modem	3 AO1 1b (1) AO2 2b (2)	
5bi	1 mark per bullet to max 1 • The rate at which the signal changes / oscillates // number of times it repeats per unit of time • Measured in GHz	1 AO1 1a (1)	
5bii	1 mark per bullet to max 2 • A channel is the range of frequencies that will transmit data • Two devices using the same / overlapping channels will be subject to interference • Choice of channel allows users to reduce / minimise interference from other devices.	2 AO1 1b(2)	
5c	1 mark per bullet to max 3 • Ethernet is a protocol • … within the TCP/IP stack • … it governs the connection of devices within the office • … that governs the transmission of data between devices in the office • … uses cables to transmit data between devices in a LAN	3 AO1 1a (1) AO2 1a (2)	
5d	1 mark per bullet to max 5 • The computer splits the file into packets • Each packet is of a fixed size • The packets are given a header • . including the destination address • ...and the packet number • Packets find their own way across the network to the destination • Server waits until all packets have arrived • Server reorders packets to create the file • Any missing / non-arriving packets are re-requested • error checking is performed on receipt of packets and	5 AO1 1b (2) AO2 2b (3)	

	retransmission is requested for corrupted packets.		
5e	1 mark per bullet to max 3 • Increased security • …need to log onto the virtual network • … people using the shopping centre wifi cannot log onto the virtual network • Users can only see the data/files/people related to them • .., no access to other data/files/people they should not have access to • Company does not need to set up individual networks	3 AO2 1b(3)	
5f	1 mark per bullet to max • Number of people accessing the network • … the more people = the more data being transmitted • … the more data being transmitted = more collisions • Interference • … e.g. electrical interference • …stops/slows the transmission of data	3 AO1 1b(3)	