

GCE

Computing

Unit **F451**: Computer Fundamentals

Advanced Subsidiary GCE

Mark Scheme for June 2016

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All examiners are instructed that alternative correct answers and unexpected approaches in candidates' scripts must be given marks that fairly reflect the relevant knowledge and skills demonstrated.

Mark schemes should be read in conjunction with the published question papers and the report on the examination.

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These are the annotations, (including abbreviations), including those used in scoris, which are used when marking

Annotation	Meaning
	Omission mark
	Benefit of the doubt
	Subordinate clause / consequential error
	Incorrect point
	Expansion of a point
	Follow through
	Not answered question
	No benefit of doubt given
	Point being made
	Repeat
	Slash / half-mark
	Correct point
	Too vague
	Zero (big)
	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.

			Answer	Marks	Guidance
1	a		<input type="checkbox"/> A printer [1]... <input type="checkbox"/> ... to print (hard copies) of photographs/relevant documentation [1] OR <input type="checkbox"/> A monitor [1] ... <input type="checkbox"/> ...which may be of a larger size/higher quality than that on her laptop making editing easier. [1]	2	Accept any output device if accompanied by a sensible justification.
	b	i	The <i>programs/sets of instructions</i> that run on a computer system.	1	
		ii	<input type="checkbox"/> Systems software controls the hardware [1] <input type="checkbox"/> Applications software will allow the photographer to do something useful. [1]	2	Accept other system software functions e.g. <ul style="list-style-type: none"> • Provides a platform for applications software • Manages memory • Provides a user interface
	c		Optical Medium/DVD-R(W)/CD-R(W)/BD-R(E) [1] Plus one of <input type="checkbox"/> Durable so unlikely to get damaged in the postage process. [1] <input type="checkbox"/> Low Cost per MB [1] <input type="checkbox"/> Most people are likely to have a drive able to read them. [1] <input type="checkbox"/> <i>Small/light</i> therefore <i>easier/less expensive</i> to send by post [1] OR Flash Media/USB memory stick[1] Plus one of <input type="checkbox"/> Durable so unlikely to get damaged in the postage process. [1] <input type="checkbox"/> Almost all computers have USB ports so will be able to use them. [1] <input type="checkbox"/> <i>Small/light</i> therefore <i>easier/less expensive</i> to send by post [1]	2	Accept: Blu-Ray-R Do not accept: CD, DVD, CD ROM, Blu-Ray USB for 1 st mark But can award valid 2 nd mark in this case

		Answer	Marks	Guidance
1	d	<p>Four of:</p> <ul style="list-style-type: none"> <input type="checkbox"/> All photos can be gathered first. [1] <input type="checkbox"/> No user interaction required. [1] <input type="checkbox"/> No need for immediate feedback [1] <input type="checkbox"/> Same process is being applied to all photographs [1] <input type="checkbox"/> Can be done at a time when processor is not busy [1] <input type="checkbox"/> All input data is in the same (data) format (i.e. a photograph). [1] 	4	
	e	<p>Two of:</p> <ul style="list-style-type: none"> <input type="checkbox"/> She will have to wait for the product to be made [1] <input type="checkbox"/> it will cost a large amount of money to produce [1] <input type="checkbox"/> help will not be easily available as there is no user community [1] <input type="checkbox"/> Has not been 'tried and tested' [1] <input type="checkbox"/> there are likely off the shelf alternatives [1] 	2	
2	a	<ul style="list-style-type: none"> <input type="checkbox"/> Double entry/ data entered twice [1] ... <input type="checkbox"/> ...and the <u>system</u> checks for differences. [1] <p>OR</p> <ul style="list-style-type: none"> <input type="checkbox"/> Proof reading [1] <input type="checkbox"/> The entered data is visually compared to the original source material [1] 	2	
	b i	<p>Three of:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Unicode is a character set [1] <input type="checkbox"/> Mapping <u>different</u> binary values to characters (on the screen). [1] <input type="checkbox"/> Each character is represented by 1-4 bytes. [1] <input type="checkbox"/> It supports a very large number of characters [1] <input type="checkbox"/> It is backward compatible with ASCII [1] 	3	Accept each character is represented by 1byte/2 bytes/4bytes (or equivalent value in bits) for BP 3

			Answer	Marks	Guidance
2	b	ii	<input type="checkbox"/> Asim's text editor may only support ASCII which doesn't include characters for the chess piece [1] <input type="checkbox"/> Cannot recognize/understand the binary values of the two pieces [1] OR <input type="checkbox"/> Asim may be using a font which doesn't include a representation for the chess pieces... [1] <input type="checkbox"/> ...and so those characters can't be represented. [1]	2	Question states <u>plain text file</u> so no credit for mention of missing graphics files.
2	c		Four of: <ul style="list-style-type: none"> • Format that OMR can detect (e.g. lozenges).[1] • Primarily use <i>closed questions/multiple choice</i>. [1] • Consistent format for answers (e.g. if 1 is not agree at all and 5 is agree entirely not switching round) [1] • Logical ordering of questions. [1] • Sensible use of space [1] 	4	
3	a	i	Two of: <ul style="list-style-type: none"> <input type="checkbox"/> A LAN covers a small geographical area (e.g. a building or campus). [1] <input type="checkbox"/> A LAN uses connections owned by the organisation that owns it. [1] <input type="checkbox"/> More secure than a WAN [1] 	2	Only award security mark if it is relative
		ii	Two of: <ul style="list-style-type: none"> <input type="checkbox"/> A WAN covers a large geographical area.[1] <input type="checkbox"/> A WAN often uses third party connections.[1] <input type="checkbox"/> Less secure than a LAN [1] 	2	Only award security mark if it is relative
	b		<input type="checkbox"/> A router [1]... <input type="checkbox"/> ... A device that passes data between two networks. [1] OR <input type="checkbox"/> A gateway [1]... <input type="checkbox"/> ... A device which connects two dissimilar networks to each other.[1]	2	Do not accept MODEM. Do not accept '...connects LAN to WAN' for 2 nd mark.

	Answer	Marks	Guidance
c	<p>Mark band 6-8. High level response. Candidate has discussed the key characteristics of both menu and natural language interfaces. They have justified which will be best for the scenario relating their reasoning to their discussion. Candidate has used appropriate technical terminology throughout. There are no spelling errors or errors of grammar.</p> <p>Mark band 3-5. Medium level response. Candidate has described both types of interface. They have attempted to justify which one would be best for the application. Candidate has used some technical terminology in the response. There may be spelling errors or grammatical errors, but they are not obtrusive.</p> <p>Mark band 0-2. Low level response. Candidate has only described one of the types of interface. They may have stated the type of interface the app should use but not attempted to justify their choice. There will be a lack of cohesion in the response. Candidate will fail to use correct technical terms in the response. Spelling and grammatical errors affect the readability of the response.</p> <p>Points may include</p> <ul style="list-style-type: none"> <input type="checkbox"/> Natural language is communicating with a computer using the same language one would use when communicating with a person. (Natural language is not the same as speech recognition - though often used together.) <input type="checkbox"/> Natural language interface on a phone is likely to require voice input... <input type="checkbox"/> ... which is not suited to certain environments (e.g. library or building site). <input type="checkbox"/> If using keyboard entry, could be laborious. <input type="checkbox"/> Natural language is still an evolving technology... <input type="checkbox"/> ...and so requests aren't always interpreted correctly.... <input type="checkbox"/> ...works best in a limited domain – such as ordering coffee. 	8	

			Answer	Marks	Guidance
			<ul style="list-style-type: none"> <input type="checkbox"/> In theory require no computing knowledge to use. <input type="checkbox"/> Menu driven is when a user is presented with a series of options... <input type="checkbox"/> ...each leading to further options until the desired selection is made. <input type="checkbox"/> Very restrictive so not suited to programs which offer large amounts of freedom. .. <input type="checkbox"/> ...but this makes them easy to use and well suited to applications where users need to choose from a limited number of options (such as ordering coffee). 		
4	a	i	11000111 [1 mark per nibble]	2	
		ii	0001 1001 1001 [1 mark for the right most nibble, 1 mark for the remaining 2 nibbles.]	2	
		iii	307 [1 mark for the '30' 1 mark for the '7']	2	
	b		<p>Method [3 marks]</p> <ul style="list-style-type: none"> <input type="checkbox"/> Treat left most bit as negative value (e.g. -128) [1] <input type="checkbox"/> Treat remaining bits as positive values [1] <input type="checkbox"/> Total them the relevant placeholder values. [1] <p>OR</p> <ul style="list-style-type: none"> <input type="checkbox"/> Work out the positive equivalent in binary [1] <input type="checkbox"/> From the right, working left copy down all the bits up to and including the first 1 [1] <input type="checkbox"/> Flip the remaining bits [1] <p>OR</p> <ul style="list-style-type: none"> <input type="checkbox"/> Work out the positive equivalent in binary [1] <input type="checkbox"/> Take the one's complement (e.g. flip the bits) [1] 	4	

		Answer	Marks	Guidance
		<input type="checkbox"/> Add one [1] Answer [1 mark] 11010101 [1]		
5	a	<input type="checkbox"/> Determines whether the project is likely to be possible [1] <input type="checkbox"/> Without it, time and money may be spent on a project that is likely to fail. [1] <p style="text-align: right;">[Max 1]</p> In terms of <input type="checkbox"/> Cost benefit analysis [1] <input type="checkbox"/> Budget available [1] <input type="checkbox"/> Time available [1] <input type="checkbox"/> Technically possible/hardware available [1] <input type="checkbox"/> Effect on company's practices/workforce [1] <input type="checkbox"/> Legally/ethically possible [1] <p style="text-align: right;">[Max 4]</p>	5	
5	b	<input type="checkbox"/> Questionnaire... [1] <input type="checkbox"/> ...set of questions given out to potential users to fill in and return [1] <input type="checkbox"/> Interview... [1] <input type="checkbox"/> ...face to face discussions where potential users are asked questions. [1] <input type="checkbox"/> Observation... [1] <input type="checkbox"/> ...Where users of the existing system are observed using it. [1] <input type="checkbox"/> Meeting...[1] <input type="checkbox"/> ...Group of users sit down with analyst to discuss current system [1]	6	

			Answer	Marks	Guidance
			<ul style="list-style-type: none"> <input type="checkbox"/> Existing documentation... [1] <input type="checkbox"/> ...used in the system is examined [1] <p>(Max 3 for methods named, Max 3 for their descriptions)</p>		
	c	i	A system that applies existing (expert) knowledge to solve problems. [1]	1	Do not accept Expert System
		ii	<p>A store of the knowledge around that problem area [1] Plus one mark for sensible example. [1] E.g.:</p> <ul style="list-style-type: none"> - Translation of a word. - Word ending. - Plural version of a word. <p>(Accept any sensible example. There is no need for accuracy on the linguistic terminology providing the example they give is feasible.)</p>	2	Allow a rule as an example (e.g. how a verb should be conjugated.)
6	a		<p>Two from:</p> <ul style="list-style-type: none"> <input type="checkbox"/> Decodes instructions. [1] <input type="checkbox"/> Sends control signals to coordinate movement of data through the processor/execute instruction. [1] <input type="checkbox"/> Controls buses [1] 	2	Accept manages/coordinates/synchronises the FDE cycle for BP 1 and 2
	b		<ul style="list-style-type: none"> <input type="checkbox"/> Stores the memory location of the data to be fetched/ stores the memory location 50 [1] <input type="checkbox"/> Transfers the memory location to access the data (to be fetched)/ transfers the memory location 50 [1] <input type="checkbox"/> Transfers the data from the memory location specified by MAR/ Transfers the data from the memory location 50 [1] <input type="checkbox"/> Stores the data from memory location specified by MAR/ Stores the data from memory location 50 [1] 	4	

			Answer	Marks	Guidance
	c	i	Wireless	1	Accept Bluetooth
		ii	Two from: <ul style="list-style-type: none"> <input type="checkbox"/> The smart watch may receive data at a faster rate than it can handle it [1] <input type="checkbox"/> Data is stored temporarily in a buffer... [1] <input type="checkbox"/> ...Until the processor is available/while processor is working on something else. [1] 	2	
	d	i	<ul style="list-style-type: none"> <input type="checkbox"/> ROM is read-only (RAM can be written to). <input type="checkbox"/> ROM is non-volatile (RAM is volatile) <input type="checkbox"/> ROM is (generally) smaller than RAM 	2	The term volatile does not have to be specifically used accept keeps it's contents when power is turned off.
6	d	ii	One from: <ul style="list-style-type: none"> <input type="checkbox"/> Boot program[1] <input type="checkbox"/> Operating System [1] 	1	Do not accept boot file Accept BIOS
7	a		Three from: <ul style="list-style-type: none"> <input type="checkbox"/> Video streaming requires a large amount of data... [1] <input type="checkbox"/> ...In a short period of time [1] <input type="checkbox"/> Video streaming is time sensitive [1] <input type="checkbox"/> Or else there are interruptions in the video [1] 	3	
	b		Two from: <ul style="list-style-type: none"> <input type="checkbox"/> Copyright of the soundtrack belongs to the original artist/record company [1] <input type="checkbox"/> permission must be sought to use it [1] <input type="checkbox"/> otherwise copyright law is being broken [1] 	2	Accept 'copyright' for BP 1
	c		Purpose: <ul style="list-style-type: none"> <input type="checkbox"/> Archiving is done to free up space on a system [1] Process: <ul style="list-style-type: none"> <input type="checkbox"/> Old/unused/redundant files (are compressed)... [1] <input type="checkbox"/> ...copied onto a different storage medium [1] <input type="checkbox"/> Original data deleted [1] 	4	Accept 'moved onto different storage medium' as Process BP 1 and 2 combined.

			Answer	Marks	Guidance
			Max 3 for process		
	d	i	Three from: <ul style="list-style-type: none"> <input type="checkbox"/> A set of rules... [1] <input type="checkbox"/> ...that define the communication of data [1] <input type="checkbox"/> focusing on how data is represented [1] <input type="checkbox"/> appropriate e.g. character set/ baud rate [1] 	3	
		ii	<ul style="list-style-type: none"> <input type="checkbox"/> The physical layer can be changed [1] <input type="checkbox"/> Without rewriting the software working on the logical layers. [1] 	2	Allow opposite the software can be changed without making alterations to the physical layer.
8	a		Four from: <ul style="list-style-type: none"> <input type="checkbox"/> Ensure only relevant data is held about them [1] <input type="checkbox"/> It is kept up to date [1] <input type="checkbox"/> It is accurate [1] <input type="checkbox"/> Must not be held longer than necessary. [1] <input type="checkbox"/> Employees are given access to their data [1] <input type="checkbox"/> Data must be kept securely [1] <input type="checkbox"/> Data must not be passed on to 3rd parties without permission. <input type="checkbox"/> Data must not be passed outside the EU [1] 	4	
8	b		Mark band 6-8. High level response. Candidate has discussed how computers have changed people's work patterns and related these points to the impact it has on their well being. Candidate has used appropriate technical terminology throughout. There are no spelling errors or errors of grammar. Mark band 3-5. Medium level response. Candidate has described how computers have changed people's work patterns and how computers affect workers' wellbeing but not linked the two.	8	

	Answer	Marks	Guidance
	<p>Candidate has used some technical terminology in the response. There may be spelling errors or grammatical errors, but they are not obtrusive.</p> <p>Mark band 0-2. Low level response.</p> <p>Candidates have made some points about how computers affect work patterns or wellbeing. There will be a lack of cohesion in the response. Candidate will fail to use correct technical terms in the response. Spelling and grammatical errors affect the readability of the response.</p> <p>Points may include:</p> <ul style="list-style-type: none"> - Computers have reduced the monotony of some jobs.... - ...Meaning people find their work more challenging and rewarding. - They allow workers to collaborate with colleagues across the world... - ...Meaning people can enjoy sharing ideas. - They have meant having strong ICT skills a fundamental part of many jobs... - ..Which can put pressure on people to acquire/keep up to date these skills. - They have allowed people to work more flexibly including working from home... - ...meaning they can have a better work/life balance... - but can lead to them feeling isolated. - ... and potentially feeling pressured into working outside of normal hours. 		

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