GCE

Computing

Unit **F451:** Computer Fundamentals

Advanced Subsidiary GCE

Mark Scheme for June 2015

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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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MARK SCHEME FORMAT 1

Question			Answer/Indicative content	Mark	Guidance
1	a	(i)	-RAM is volatile/ROM is not volatile -RAM is editable/ROM cannot be altered -RAM is larger/ROM is smaller (1 per -, max 2)	2	
		(ii)	-User files/software/OS <u>currently in use</u> -User must be able to alter contents of file/computer needs access to software but needs to be able to replace it - RAM offers direct access. - RAM operates at a much faster speed than most secondary storage devices.	2	1 mark per item, one mark per reason
		(iii)	-Boot file/program/BIOS -Must be available when computer switched on (therefore must be stored on medium which is non-volatile) - The boot program/BIOS must not be deleted/unintentionally amended (and therefore is best stored on a read-only medium.)	2	1 mark per item, one mark per reason
	b	(i)	-Characters are scanned -Image of character is compared to library of images of characters to find best match -e.g. Reading documents for blind people	3	2 mark per description, 1 mark per example
		(ii)	-Document is scanned for position of mark -Position is used to determine data to be entered -e.g. multi choice exam paper	3	2 mark per description, 1 mark per example

Question			Answer/Indicative content	Mark	Guidance
2		**(i)**	-Temperature sensor /Heat sensor/Thermistor - to read the water temperature (in to the processor). -Keypad/Keyboard - to allow the user to change the required temperature. (1 per -, max 1 pair, max 2)	2	Note: Other answers are possible and are acceptable if a sensible use is given to justify their use. NOT Thermometer
		(ii)	-Heater -To increase the temperature of the water -Actuator - to switch heater on/off -Screen/Monitor -to show current temperature (1 per -, max 1 pair, max 2)	2	
		(iii)	-Solid state storage/flash memory card/hard disk… -to store program to run system/to store parameter(s)	2	NOT storing temperature readings
		(iv)	-Real-time should be used as the processor will (make decisions and) take action immediately. -Fish may be harmed if temperature is outside parameters (for too long).	2	NOT simply "Fish may die"

Question			Answer/Indicative content	Mark	Guidance
3	a	(i)	01011001	1	
		(ii)	10001001	1	
		(iii)	131	1	
	b		-Split the binary number in groups of 4 -Change each into a single value/(Hexadecimal) digit -Digits which are between 10 and 15 are given letters A to F -In this example: 0101 = 5 and 1001 = 9/Therefore 89 = 59(hex) (1 per -, max 3)	3	
	c	(i)	10100111	1	
		(ii)	10111000	1	
	d	(i)	1 0 1 0 0 1 1 1 1 0 1 1 1 0 0 0 ——————————— 0 1 0 1 1 1 1 1 Carried 1 gets removed --> X1 1 (1 for 8 bit correct answer, 1 for showing appropriate correct carries)	2	Note: follow through from candidate answers to part (c) If ft answer generates no carries – max. 1 mark
		(ii)	-Answer needs 9 bits/ Carry/overflow out of 8 bit byte -Two negative numbers have been added and the result is a positive number -Answer is 95 (1 per -, max 2)	2	NOT simply "overflow"

Question	Answer/Indicative content	Mark	Guidance
4	**Points about the example O.S. given include:** -Only one user can use the system -at a time -Other users may use the system at other times therefore essential to secure user files -System can appear to be running more than one task at a time -each receiving a slice of processor time -Examples of running many tasks **Points to be made about the purposes of operating systems include:** • To control the hardware of the system through resource management/scheduling/memory management (paging, segmentation)/ hardware drivers. • To provide a platform on which applications can run • To provide file handling • To provide a user interface e.g. command line interface • To handle communications e.g. across a network • To allow for translation of code • To provide utility software to carry out household tasks • To provide security for user files • To provide interrupt handling	8	**Mark band 6 – 8. Higher level response** Candidate has described a full range of purposes of operating systems AND has described in detail the given examples appropriately. Candidate has used appropriate technical terminology throughout. There are few if any spelling errors or errors of grammar. **Mark band 3 - 5. Medium level response** Candidate has described some of the purposes of operating systems OR has described in detail the given examples appropriately. Candidate has used some appropriate technical terminology in the response. There may be spelling errors or errors of grammar in the response but they are not obtrusive. **Mark band 0 - 2. Low level response** Candidate has described a purpose of operating systems OR has described the given example appropriately. Candidate has failed to use appropriate technical terminology. There are likely to be spelling errors and/or errors of grammar, which will disrupt the flow of the response.

Question			Answer/Indicative content	Mark	Guidance
5		(i)	-Is needed to store the address of the next instruction (to be processed) -Value is then sent to the MAR -After sending the value the PC is incremented/changed to address held in CIR if the operation is a Jump	2	
		(ii)	-Contains the address of the instruction (to be accessed in memory)… - …address of instruction sent from PC - Contains the address of the data (to be accessed in memory)… - …address of data sent from CIR	2	
		(iii)	-Contains the instruction which has been accessed from memory - Contains the data which has been accessed from memory - That is referenced by the MAR/Instruction sent to CIR - acts as a buffer	2	
6	a		-Training of staff/type of training… decide whether in-house or commissioned/classroom or individual/group… -Installation planning/ decide whether direct,parallel,phased,pilot -Creation of files/who?/will it be necessary to employ temporary staff to do it?/where will data come from?/time period necessary… - Installation of hardware/how?/who?/when... -Installation schedule/plan to minimise disruption. (2 per -, max 2 -, max 4)	4	2nd mark in each pair is dependent on first Not planning what hardware to install
	b		-Corrective -To correct bugs in software when being used with real data -Adaptive -To alter software because of internal/external need eg VAT paid on produce increased to 12% -Perfective -To improve performance of software/efficiency of software	6	2nd mark in each pair is dependent on first

Question			Answer/Indicative content	Mark	Guidance
7	**a**		A set of rules… -…to govern data transmission (between devices)	2	Must be rules – plural 1st bullet point
	b		Answers may include: -Error correction -odd or even parity/checksum/echoing -Medium for communication -Use of cable/wireless/…/type of cable for communication -Mode of transmission -simplex/duplex/serial/parallel -Coding used for characters -Whether ASCII/UNICODE/… (1 per -, max 3 pairs, max 6)	6	NOT Bit/Baud rate. Accept other appropriate examples 2nd mark not dependent on 1st mark
	c		-Some data does not need to be used immediately… -…therefore does not require a high bit rate -e.g. car sales data -Some data needs to be used immediately… --…otherwise loses its value -…therefore requires a high bit rate/to avoid buffering -e.g. <u>streaming</u> car videos (1 per -, max 6)	6	Example must be in context.

Question			Answer/Indicative content	Mark	Guidance
8	a	(i)	-Provides a link between (local area) networks -To connect the student and/or teacher and/or administration networks together.	2	2nd mark must be in context.
		(ii)	-Provides a link between two dissimilar networks -Links the school networks to the Internet	2	Accept connect a LAN to a WAN for 1st bullet point 2nd mark must be in context.
	b	(i)	-Simple to use/intuitive -Allows data entry -Leads user through the required information/Logical layout -Uses text boxes, radio buttons,… -Easier to validate data entry (1 per -, max 3)	3	
		(ii)	-Commands are <u>typed in</u> (to the system) -at the (screen) prompt -Allows access to all areas of the system - Supervisors can carry out tasks through commands quicker than they could through other interfaces. - Commands can be grouped so common tasks can be automated. (1 per -, max 3)	3	
		(iii)	-GUI -Simple/intuitive to use (even when learning a system) –Likely to be a similar interface to other applications of which the users have experience. - Provides contextual help (e.g. tool tips)/taskbar - Provides Windows and Icons and Menus and Pointers.	3	1 mark interface, 2 marks justification Justification marks dependent on interface If incorrect interface – no marks for justification If WIMP as the interface – no credit for interface mark but read on If no interface – read on for GUI/WIMP

Question			Answer/Indicative content	Mark	Guidance
9	a		<u>Purpose</u> -Manages data storage/organises data storage <u>Uses</u> - Used for the deletion/sorting/moving/copying/creation of files/folders - Manage the storage of software - Manage the storage of stock files - To access files	3	Maximum of 2 marks from Uses
	b		<u>Purpose</u> - Enable peripheral and OS to communicate <u>Uses</u> - To configure hardware -e.g. would be used to install a new keyboard; mouse; printer *(accept any examples sensible within context)*	3	Maximum of 2 marks from Uses Not enable <u>hardware</u> to communicate
	c		<u>Purpose</u> -<u>Automatically</u> makes a copy of files -Storing them in a different location/medium - in case of loss/corruption (of original) <u>Uses</u> -To make Incremental back-ups - Ensure that sales/stock data is backed up	3	Maximum of 2 marks from Purpose, 2 from Uses

Question	Answer/Indicative content	Mark	Guidance
10	Points to include: -People are becoming more reliant on portable computer systems -Instant access to data -Accessible anywhere (where there is a signal) -Problems for those in society who are technologically unaware -Problem with divided society, the haves and the have nots -Social interaction apps make contacts more plentiful -No difficulty in contacting individuals or groups of individuals -Problems caused by social pressures to conform and use them -Problems caused by online bullying - Loss of traditional means of communication	8	**Mark band 6 – 8. Higher level response** Candidate has discussed the effects of portability of devices AND social interaction applications on society. The candidate has discussed BOTH the positive and negative effects of portability and social interaction applications on society. Candidate has used appropriate technical terminology throughout. There are few if any spelling errors or errors of grammar. **Mark band 3 - 5. Medium level response** Candidate has discussed effects of portability of devices OR social interaction applications on society and has discussed both the positive and negative. OR Candidate has discussed the effects of portability of devices AND social applications on society but has only discussed either the positive or negative effects but not both. Candidate has used some appropriate technical terminology in the response. There may be spelling errors or errors of grammar in the response but they are not obtrusive. **Mark band 0 - 2. Low level response** Candidate has described an effect of portability of devices or social interaction apps on society. Candidate has failed to use appropriate technical terminology. There are likely to be spelling errors and/or errors of grammar, which will disrupt the flow of the response.

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