GCE

Computing

Mark Scheme for January 2012

Annotations

Annotation	Meaning
^	Omission mark
BOD	Benefit of doubt
C	Subordinate clause/Consequential error
Cross	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	Tick
TV	Too vague
ZERO	Zero (big)

Question			Answer	Marks	Guidance
1	(a)	(i)	• Allows data to be given [to the computer].	1	Not accepted: Interacts with / A to D.
		(ii)	• Reports the results of processing from the computer [to the user].	1	Not accepted: Interacts with / A to D.
	(b)		• OMR • To read the marks made on the form [by the customer] • Printer • To print the receipt that needs to be given [to the customer].	4	Not accepted: Read numbers, scanner without OMR.
	(c)		• Value of barcode compared with barcodes stored on stock file. • Field containing number of items in stock is read and... • ...decremented and... • ...[new value compared with] a minimum amount of stock allowed. • If number in stock is less than minimum stock AND no order is outstanding for this item... • ...supplier file is searched for details of supplier which are used to... • ...output message [to manager] advising of need /automatically create an order and... • ...set field showing outstanding order.	6	(1 per •, max 6) Not accepted: Remove stock items from the database.

Question			Answer	Marks	Guidance	
					Content	**Levels of response**
2	(a)		Points may include: • Voice recognition • Computer system can interpret spoken word into commands appropriate for the application • Computer systems for the blind • Barcode scanning • Pattern of light and dark lines used to input a code number which can relate to a record of data about the object • Supermarket checkout and barcodes on items of stock • OMR • Reader reads the position of marks on the form/translates position into information • School register • OCR • Reader reads shape of character/compared with library of shapes in computer • Document reader for blind people • MICR • Characters printed using magnetic ink in order to ensure that character is properly read • Numbers on the bottom of bank cheques	8		**High level response (6–8):** Candidates will have described at least two automatic methods in detail, **and** explained at least two advantages of automatic data entry over manual entry for at least two applications. Providing there is more than one description/explanation it is the quality and depth of the answer rather than the number. Answers will be complete and in a structured format, with subject specific terminology been used accurately and appropriately. There will be few if any errors in spelling, punctuation or grammar. **Medium level response (3–5):** Candidates will have attempted to describe at least one automatic method, **and** attempted to explain at least one advantage of automatic data entry over manual entry for at least one application. **Or** multiple methods without advantages **or** multiple advantages without methods. Descriptions/explanations may be incomplete/weak and little more than statements. There will be some structure and some use of subject specific terminology, although not always used appropriately. There may be occasional errors in spelling, punctuation or grammar.

Question	Answer	Marks	Guidance	
			Content	**Levels of response**
	- Image capture - Image input direct from a digital camera - Tourist photographs taken to transfer to souvenir items - Sensors - Change to condition in real world noted by sensor which returns a value - Reading temperature for a central heating system Advantages of automatic data entry may include: - Human being does not need to spend time taking readings/inputting data - Data readings/input will be more accurate... ...will be entered at more precise times - There will be no chance for transcription errors to be made - There will be no chance for transposition errors to be made - Data can be better relied upon - Data is more likely to be accurately input Applications using automatic data entry may include: - Control applications			**Low level response (0–2):** Answers are likely to be little more than identifications with some very weak descriptions rather than explanations. There may be little/incorrect or no use of subject specific terminology. Errors in spelling, punctuation or grammar are likely to be intrusive.

Question			Answer	Marks	Guidance	
					Content	**Levels of response**
			• Applications using large quantities of data • Applications where accuracy of data collection is important			

Question			Answer	Marks	Guidance
	(b)		• Verification checks for errors created by copying data from the original document into the computer manually. • Data has not been transcribed / no human involved in input… • …so there is no possibility of a transcription error /no room to introduce error to the data. • Data is manually input twice. • The computer compares the two sets of data that have been entered. • When there is a difference in the two sets of data the user is asked to re-enter the data.	4	(1 per •, max 4) Not accepted: 'Knows it is right' Not accepted: cross-referenced the data input – must imply matching the two inputs against each other
3	(a)	(i)	• [Clock on and clock off times are collected] by suitable input device eg card reader... • and stored [in suitable storage device eg hard disk] • At suitable interval eg weekly/monthly • Inputs are processed together with the main payroll file to produce / pay is calculated • Payslips/updated payroll file/tax details produced. • Automatic transfer of funds to workers' bank accounts.	5	(1 per •, max 5) Credit use of a transaction file with master file

Question			Answer	Marks	Guidance
		(ii)	• All the data is collected before any processing is done • Processing carried out at specific time / overnight... • ...related to requirements of application / same day every week. • Results not needed immediately • Large amounts of data... • …requiring similar processing... • …does not need human interaction... • …ties up peripherals for long periods of time /peripheral based process.	5	(1 per •, max 5) Not accepted: 'similar data' rather than similar processing. Not accepted: 'processed at the same time'.
	(b)	(i)	• National information about individuals eg NI number / tax code • Personal information eg address, phone number / payroll number. • Financial information eg bank account number / previous earnings. • Holiday dates/grade of pay. • Health issues.	3	(1 per •, max 3) Not accepted: 'Name' by itself. Allow 'bank details'

Question			Answer	Marks	Guidance
		(ii)	Fears eg • Worried about identity theft [if outsiders can steal data like NI number]. • May be pestered/targeted by nuisance calls • Burglary at home if work patterns are known • May be subject to bank account being targeted for theft. • Information may be passed on to third parties. Measures taken eg • Firewalls to restrict access to system from unauthorised systems. • Passwords. • Encryption [to protect files]. • IDs to monitor access / provide audit trails. • Restricted access to a few named employees. • Employees informed of measures taken. • Physical security eg locked door.	5	(1 per •, max 4 per fears or measures, max 5)
4	(a)	(i)	• Local area network. • Computers linked together over a small area. • Shared devices. • May be hard-wired or wireless.	2	(1 per •, max 2) Not accepted: A small number of computers. Not accepted: Shared files (could be WAN).
		(ii)	• The exchange of signals between devices to signify that they are ready for communication. • A number of rules/protocol will be agreed prior to the communication beginning... • ...example given eg agree on baud rate. • Necessary because without agreement on rules the two devices cannot understand each other's signals. • One device may not be ready for communication eg may be switched off.	4	(1 per •, max 4)

Question			Answer	Marks	Guidance
	(b)	(i)	• The rules which the data has to follow. • Suitable example eg baud rate. • Suitable explanation eg if one device transmits data at a different rate than it is received, the bits in the data will be mixed up.	3	(1 per •, max 3) Acceptable: TCP/IP/FTP/HTTP for second mark with explanation for third mark.
		(ii)	• The rules that are used to govern the methods used to set up the communication / medium of communication. • Suitable example eg what frequency will be used in a wireless network. • Suitable explanation eg because if different frequencies are used then the receiving device will never receive the (communication as it will be listening to different parts of the frequency which do not contain the communication).	3	(1 per •, max 3) Acceptable: Serial / Parallel Acceptable: Duplex / half duplex / simplex Not: 'What can be touched'
5	(a)	(i)	A small area of computer memory / temporary storage / holds data.	1	
		(ii)	• A signal or message sent to the processor/It stops the current activity of the processor.	1	
	(b)		• Buffer filled [from primary memory]. • Processor can continue with other tasks. • Buffer emptied to hard drive. • Interrupt sent to processor to request buffer be refilled. • Use of interrupt priority to determine position in interrupt queue. • Process continues until all data is transferred. • Mention of double buffering.	5	(1 per •, max 5)

Question			Answer	Marks	Guidance
6	(a)		Examples may include: • Reports / text / printouts • ...to show hard copy of readings taken from line for future reference / physical data to provide evidence. • Sound • ...to act as an alarm (in case of emergency action being required). • Video / visual display / images • ...showing real-time actions from the line. • Diagrammatic / map • ...showing a representation of the line with readings shown at their correct positions (relative to the line). • Text inverse / flashing • …to highlight important information. • Tabular • …to show state of track / points against time. • Graphical • …eg to plot usage of lines against time. • Light • …to act as an alarm to show problem with an area of the track.	6	(1 per •, max 3 pairs, max 6) Second mark dependent on the first mark. Not acceptable: Screen, VDU, monitor, speaker (devices).

Question			Answer	Marks	Guidance
	(b)		• Critical nature of application. • Large amount of information... • ...only one operator. • ...operator may miss seeing some important piece of information. • ...information must be ordered in terms of importance or according to a logical pattern. • ...danger of information overload. • Remove irrelevant information • ...need for information presentation to be prioritised according to importance. • Some information is crucial eg possible conflict between signal and points arrangement. • Use of colour must be consistent. • Consistency of presentation. • Use of sound must be minimal otherwise it will be ignored. • Must consider operator eg is the operator colour blind/deaf.	6	(1 per •, max 6) Not acceptable: Cater for computer illiteracy.
	(c)	(i)	• Controls the hardware of the computer. • Gives a platform to run other software. • Acts as an interface between the hardware/processor and the outside world/user. • Provides housekeeping software.	2	(1 per •, max 2) Accept: To enable the computer to work. Accept: example tasks eg Memory management, scheduling, interrupt handling.

	Question		Answer	Marks	Guidance
		(ii)	Examples may include: • Word processor • ...for producing letters to prospective passengers. • Spreadsheet • ...to keep the accounts for the marketing department. • Diary software • ...to ensure that members of the department are aware of meetings. • Desktop publishing software • ...to produce promotional material • Communication / email software • ...to maintain contact with offices throughout the network. • Database software • ...to store details of campaigns.	6	(1 per •, max 3 pairs, max 6) Second mark is dependent on the first mark. Not acceptable: Presentation software (in the question). Not acceptable: Specific packages eg. Publisher. Accept: Graphics software/create logo for the company Accept: Web Authoring software/to create a site for the company Accept: Video editing software/to produce a TV advert
7	(a)	(i)	01011111	2	(1 per nibble)
		(ii)	5F	2	(1 per digit)
	(b)	(i)	11011100	2	(1 per nibble)
		(ii)	10100100	2	(1 per nibble)
	(c)	(i)	<u>11000001</u> 1 11 11 1	3	(1 for correct answer, 1 for standard carries, 1 for double carry in one column) Use of denary is not allowed

Question			Answer	Marks	Guidance
		(ii)	Either: • One bit is used as a parity bit / it is set to 0 or 1… • …in order to make the number of 1's in the byte either odd or even. • System has already been set to expect either all bytes to have odd or to have even number of 1's. • If there is an error in parity, then request sent for re-transmission. Or: • Block of data is sent and received. • The received block is then returned to the transmitting device where it is compared to the block that was originally sent. • If there is a difference the entire block is re-sent.	3	(1 per •, only one method)
8			Answers may include: • Contents page / index. • Glossary. • Instructions for installation. • Instructions for operation / descriptions of required input/output • Simple maintenance procedures eg how to replace external storage device. • Error messages (and their meaning) / trouble shooting / help section. • Contacts for further assistance / Licensing agreement / warranties. • FAQs. • An explanation of the User Interface / meaning of icons / how to change settings. • Hardware requirements. • Sample outputs from given inputs.	5	(1 per •, max 5) Not acceptable: How the software works. Not acceptable: How to start the software (too vague for operation).

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