

## GCE

**ICT** 

**Advanced GCE** 

Unit G063: Systems, Applications and Implications

# Mark Scheme for January 2011

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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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Question	Expected Answer	Marks	Additional Guidance
1 (a)	<ul> <li>Describe the role of a personnel system in a company. eg</li> <li>holds contact details for each employee (1) times when employees need to be contacted at home or next-of-kin in emergencies (1)</li> <li>stores details of attendance (1) planned holidays or absendance can be covered/considered (1)</li> <li>holds salary details for each employee (1) how much the employee has been paid during their time in the company/or rises given/deductions required (1)</li> <li>to store staff qualifications (1) details of which qualifications staff had before employment/at interview and any gained since (1)</li> <li>details staff training (1) courses attended to enable fulfilme of their role/holding of certain positions within the company (1)</li> <li>monitors appraisal process (1) details targets set and level completion by the individual (1)</li> <li>to ensure DPA compliance (1) indicates information is due review/has not been updated (1)</li> <li>to store start date of employment, end date and date of bin (1) to notify retirement date and enhancements for number years service/pay scales past trainee (1)</li> <li>details employment checks carried out (1) (CRB and list 98 references) to ensure individuals' safety and employability</li> <li>details contract type (full time, part time) (1) to ensure correlevel of pay (1)</li> </ul>	es ay of or of	All 4 marks can be gained from a single description.  Max 2 for list of points

Que	estion	Gd	Expected Answer	Marks	Additional Guidance
1	(b)		Identify four documents that an analyst might examine when investigating a personnel system.  Four from eg:  application forms (1)  personal details/contact details/next of kin/date of birth (1)  references (1)  CRB/employment checks (1)  certificates (1)  qualifications (1)  contracts (1)  training forms (1)  courses attended (1)  sickness record (1)  appraisal documents (1)  time slips (1)	[4]	
2	(a)		State the purpose of a hub in a network.  allows devices to communicate/connect with each other in a LAN (1)	[1]	
2	(b)		State the purpose of a bridge  connects together two LANs/ segments which use the same protocol (1)	[1]	Only award the mark where the candidate has been specific about the purpose.

Question Gd	d Expected Answer	Marks	Additional Guidance
3	Explain three limitations, for a candidate, of using a computer to answer examination questions.		This must relate to a candidate answering examination questions using a computer. Ensure the candidate's
	<ul> <li>One mark for point, one for expansion eg: <ul> <li>it may take longer to input answers (1) leaving less time to answer all the questions (1)</li> <li>diagrams may not be as intricate (1) you need knowledge of how to create diagrams on screen (1)</li> <li>need to be able to type accurately (1) to ensure answers can be marked (1)</li> <li>technical equipment may fail/not work correctly (1) meaning exam needs to be retaken/disrupted causing stress to candidate (1)</li> <li>issues related to health and safety eg length of time sat at a monitor (1) over the period of an examination eg RSI (1)</li> </ul> </li> </ul>	[6]	response establishes this.  A candidate cannot gain more than <b>three</b> marks solely for the identification of points.  Allow suitable examples which may be given in lieu of an expansion.

Question	1	Gd	Gd Expected Answer		Additional Guidance
4 (a)	(i)		Describe what is meant by a protocol.  Two from:  a standard set of rules (1)  used to ensure the proper transfer of data between devices (1)  standard methods for communicating electronically (1)  govern the exchange of data (1)  allow devices to work together (1)		
			define how data is transferred (1)	[2]	
(a)	(ii)		Describe how protocols are used within a network.  Four from:  define what control signals are used (1)  used to indicate the sending device has finished sending (1)  determine error checking to be used (1)  determine any compression methods (1)  indicates destination address (1)  used to indicate the receiving device has received data (1)  TCP/IP defines how signals are sent across the internet enabling users to communicate with each other (1)  SMTP governs the sending of emails between devices (1)  PPP governs how two computers that are directly connected to each other should communicate (1)	[4]	The role of specific protocols (though not needed) should be awarded a mark if accurately stated.

Que	estion	Gd	Gd Expected Answer		Additional Guidance
4	(b)		Describe one advantage and one disadvantage of encrypting data.  One for identifying, second for description: Advantage  • prevents details from being understood by unauthorised parties (1) by rendering the data unintelligible (1) Disadvantage  • lost decryption key/wrong decryption key (1) means unscrambling the data is not possible and makes it unusable (1)	[4]	
5	(a)		<ul> <li>Give a situation where an individual might be prosecuted under the Computer Misuse Act (CMA)(1990) and state the provision of the CMA under which the prosecution would take place.</li> <li>by guessing or intentionally discovering the individual's password and using it to log into the account (1) for unauthorised access to computer material (1)</li> <li>in addition to entering the computer system, an individual could gaining access to a user account and transmit illegal material (1) for unauthorised access with intent to commit or facilitate commission of further offences (1)</li> <li>by making changes to the contents of a computer or denying access to the computer through Denial of Service attacks (1) for unauthorised acts with intent to impair, or with recklessness as to impairing, operation of a computer (1)</li> <li>by using malicious scripts or software that will modify original code (1) for making, supplying or obtaining articles for use in computer misuse offences (1)</li> </ul>	[2]	The first mark is for the situation.  The main provisions may not be produced verbatim and the provision may form the first part of the answer, but be generous; as long as the candidate has identified one of the four main provisions and has tried to put across the gist of that provision, award a mark.

Que	estion	Gd	Expected Answer	Marks	Additional Guidance
5	(b)		<ul> <li>Describe two problems of enforcing the Computer Misuse Act (1990).</li> <li>Two from: <ul> <li>intent has to be proven (1) accidental intrusion is not a crime (1)</li> <li>a computer being used for hacking can be tracked to an address(1) but the identity of the individual(s) responsible has to be established in order to prosecute (1)</li> <li>proving who within a property was using the computer at any given point in time (1) has to coincide with when the crime was being committed (1)</li> <li>the governing body of an institution decides what is authorised and what is not (1) a code of practice has to be in place and is proved to have been breached (1)</li> </ul> </li> </ul>	[4]	
6	(a)		Resolve the many to many relationship between TABLE and CUSTOMER. Correct Answer Only:  new entity in correct location (1)  correct degree of relationship between TABLE and new entity and new entity and CUSTOMER (1)	[2]	Allow diagram or correct textual description.

Question Gd		Expected Answer	Marks	Additional Guidance
6 (b)		Using the following symbols, place the order process into a data flow diagram.  1 for representing customer as external entity (1) 1 for identifying the process of writing down each item ordered and recording them in the data store/notepad (1) 1 for identifying the process of looking up prices of each item ordered and the data store/menu they came from (1) 1 for identifying the process of writing prices down and recording them in the data store/notepad (1) 1 for identifying the process of calculating total price of the order and the data store/notepad the prices of all items came from (1) 1 for indicating the correct direction of data flow between all symbols used (1)  details of order  customer  total price  order data flow between all prices written down  maximum prices  all prices written down  modered are looked up  order calculated	[6]	The diagram itself must be accurate, however, the labelling may not accurately reflect the wording in the mark scheme.

Question Go	Expected Answer	Marks	Additional Guidance
	Questions 7-12 concern a wedding outfitter which specialises in bridal dresses, bridesmaids' dresses and gentlemen's formal wear.  The business is located in a re-furbished Victorian house, located in a small country village. The staff use computers for accounting, ordering stock and producing publicity material. The business wants to set up a wireless local area network (LAN) with internet access.		
7	Describe three possible limitations of wireless networking for the wedding outfitters.  Three from: eg One for identification to a max 3, second for description eg:  distance from base station (1) can reduce signal reception (1)  multiple tranceivers needed (1) to avoid blackspots in coverage (1)/ to maintain coverage as signal passes through walls and floors (1)  network available outside the building (1) additional security/encryption required for internal traffic (1) potential for hackers to intercept data (1)  clients' details accessible (1) non-compliance with DPA (1)  concurrent downloads by multiple users (1) reduces bandwidth capacity (1)  coverage must be carefully planned (1) as each transceiver requires different frequency (1)  requires additional hardware (1) raising cost of installation (1)  other electronic equipment (1) can interfere with signal transmission (1)	[6]	

Questio	Question		Expected Answer	Marks	Additional Guidance
8 (a)			<ul> <li>Many of the wedding outfitter's clients live abroad and place orders online.</li> <li>Explain the importance of matching the online ordering interface to the user's mental model.</li> <li>One from: <ul> <li>eg:</li> <li>users bring their own preconceptions to the interface (1) interface needs to take account of this so users can operate it successfully (1)</li> <li>most users will learn to use the interface by trial and error (1) if the interface is inconsistent with the mental model the user will get lost using the interface (1)</li> <li>mental model of the online ordering system should follow manual ordering system (1) subsequent stages are anticipated and users are not surprised by the next step (1)</li> </ul> </li> </ul>	[2]	

Compare email and video conferencing for giving progress reports on the making of a dress.	Т	For mark band 0-1, eg The following would gain one mark
Must be a comparison.  3 Two complete comparisons  2 One complete comparison  0-1 Two individual points about either side.  Topics for comparison may include eg:  visual  • video conferencing is more personal because you can see an individual wearing a dress and see its movement whereas with email you can only read a textual description or see a still photo or a video which limits viewpoints  bandwidth  • video conferencing requires higher bandwidth because live video is being sent and pixelation would detract from the dress whereas email uses low bandwidth because it is not time sensitive and photos would simply download over a longer amount of time  individuals  • video conferencing requires all individuals to be present at the same time to view the dress whereas email can be sent and will wait in the recipient's in box until accessed and viewed to give feedback  attachments  • documents about the dress can be attached to an email before sending similarly video conferencing allows the sending of documents via shared applications	b a v b	video conferencing is more personal pecause you can see an individual wearing a dress video conferencing requires all individuals to be present at the same time to view the dress

Que	stion	G	€d	Expected Answer	Marks	Additional Guidance
9	(a)			The wedding outfitters use batch processing to create invoices.  Describe batch processing.  Two from: eg:  batch processing  data is collected together over a period of time (1)  data is processed as a batch at an off-peak period/at regular intervals/when there is less demand on the processor (1)  there is less disruption to the daily work schedule (1)  enables peripherals to be accessible in the day when most needed (1)  minimum user interaction required (1)	[2]	
9	(b)			<ul> <li>Explain why the wedding outfitters use batch processing to create invoices.</li> <li>Two from eg;</li> <li>invoices can be prepared at the end of a day (1) when the computer and printer are not being used by other processes (1)</li> <li>customers' invoices can be calculated and printed without staff being present (1) (1) this increases the efficiency of the network/ efficiency of working practices for the business (1)</li> <li>increases efficiency of the network for the business (1)</li> <li>all the information concerning items on the invoice can be collected together first (1) there is no delay in the invoices being calculated (1)</li> </ul>	[4]	Answers can mix and match providing the answer forms an explanation.

Que	stion		Gd	Expected Answer	Marks	Additional Guidance
10	(a)			<ul> <li>Describe what is meant by a MIS. Two from: <ul> <li>a system that converts data so that managers can interpret the data in a readily usable form (1)</li> <li>organises information within an organisation in such a way that it can be used to produce useful information to the management of the organisation (1)</li> <li>organises and produces summaries of data in the form of charts and reports (1)</li> <li>creates links between sets of data that are inter-related (1)</li> </ul> </li> </ul>	[2]	
10	(b)	(i)		<ul> <li>Describe this method of changeover. Two from: pilot <ul> <li>the system is trialled in one area of the organisation before it is fully implemented (1)</li> <li>the results of running the new system are compared with the old system. (1)</li> <li>the old system can still be used in parts of an organisation if a problem is identified with the new system (1)</li> <li>bugs can be cleared from the system before further implementation takes place (1)</li> <li>training can be modified in the light of experience (1)</li> </ul> </li></ul>	[2]	
10	(b)	(ii)		<ul> <li>Explain why the pilot method of changeover is not suitable for the installation of the MIS.</li> <li>pilot</li> <li>it is one system, not installed anywhere else (1)</li> <li>it can not be trialled in one area first before fully implemented due to the size of the business (1)</li> </ul>	[2]	

Que	stion	Gd	Expected Answer	Marks	Additional Guidance
11	(a)		Compare the use of custom written and off-the-shelf solutions for the new stock control system.		
			Must be a comparison.		
			3 Two complete comparisons		
			2 One complete comparison		
			0-1 Two individual points about either side.		
			Topics for comparison may include eg:		
			features		
			the custom written software will do exactly what you want whereas an off-the-shelf solution will contain bloat ware		
			memory		
			There will be no unwanted functions with a custom written solution whereas an off-the-shelf solution will contain these, increasing the memory footprint		
			cost		
			The software copyright will belong to the firm with a custom written solution and can be sold to recover development costs whereas an off-the-shelf solution is a much cheaper one off purchase		
			support		
			<ul> <li>custom written software may need specialist support to correct bugs, train users and provide extended functionality whereas off-the shelf software is likely to have been tested by many people with wider support available via books and discussion</li> </ul>		
			groups	[3]	

Question	Gd	Expected Answer	Marks	Additional Guidance
11 (b)		<ul> <li>Explain why the font size and the font style are important considerations when designing the interface of the new stock control system.</li> <li>Four from: <ul> <li>the text used on the interface must be in an easy to read size (1)</li> <li>the size needs to be appropriate to the on-screen interface and for the end user to work with (1)</li> <li>if the size of the font is too small, the questions or instructions would be illegible (1)</li> <li>the font style must be clear so that the letterforms make words easy enough to read (1)</li> <li>serif and sans serif fonts should be used for legibility and decorative fonts should be avoided as they lack clarity (1)</li> <li>both font size and font style must be used consistently throughout the interface and all related screens (1)</li> <li>variations in font size and font style should not be so dramatic as to lose the consistent look and feel of the package (1)</li> <li>font size and font style should not vary too much away from what the end user has previously experienced as familiarity will enhance the ease of use (1)</li> </ul> </li> </ul>	[4]	Answers must relate to the designing the interface of the stock control system.

Question	ı	Gd	Expected Answer	Marks	Additional Guidance
11 (c)			<ul> <li>Describe three factors that must be considered when managing the change to the new stock control system.</li> <li>One for identification to a max 3, second for description eg: <ul> <li>staff capability (1) extra staff may need to be employed (1)</li> <li>staff views (1) will need to be taken into account (1)</li> <li>changes in working practice (1) might require training and an increase in wages (1)</li> <li>systems need testing (1) and training on software provided (1) staff need to embrace new systems (1)</li> <li>equipment needs to be installed (1) and training on hardware given/possible implications for health and safety (1)</li> <li>accommodation for the new workforce and for the machines (1) must be planned to avoid disruption to the business (1)</li> <li>financial aspects (1) business may have to close during changeover (1)</li> </ul> </li> </ul>	[6]	
11 (d)			<ul> <li>Identify and describe three different types of maintenance that can be used during the life of the stock control system. adaptive maintenance (1st mark)</li> <li>will be needed if changes in working practices are identified in a review (1)</li> <li>or if there is an increase in the number of customers/employees (1)</li> <li>to adapt the system if new legislation concerning a business or organisation is introduced (1)</li> <li>to enable the system to operate with new hardware (1)</li> <li>perfective maintenance (1st mark)</li> <li>if new technology shows that the performance of the system could be improved (1) improving speed of searches (1)</li> <li>corrective maintenance (1st mark)</li> <li>for fixing bugs/errors in the software (1)</li> </ul>	[6]	Candidates cannot be awarded the second mark unless it is clear which type of maintenance is been described.

12 (a)			Additional Guidance		
	<ul> <li>Describe three advantages for the wedding outfitters of using fibre optic cable to connect the two buildings.</li> <li>One for advantage to a max 3, second for description: <ul> <li>greater capacity (1) more data can be exchanged simultaneously (1)</li> <li>transmission rates (1) higher volume of data per second (1)</li> <li>less signal degradation (1) data can travel greater distances without amplification (1)</li> <li>not susceptible to electrical interference (1) better quality of data transmission/less errors (1)</li> <li>security (1) less difficult to tap in to (1) doesn't leak light (1)</li> <li>carries digital signals (1) no need for signal conversion (1)</li> </ul> </li> </ul>	[6]	The identification mark for a suitable advantage of fibre optic cable needs to be awarded first.  Without this first mark, candidates can not gain the second mark for an expansion of the identification.  A candidate can not gain more than three marks solely for the identification of single advantages.		
12 (b)	Describe how the wedding outfitters could use a virtual				
	<ul> <li>network within their LAN</li> <li>two or more of their departments could exist on the LAN (1) but each computer would only communicate with others in the same department (1)</li> <li>services such as file sharing, printing and application sharing would be the same as on the single LAN (1) but on a virtual network these services could be allocated to just those individuals within a particular department (1)</li> <li>to offer secure remote access to existing resources (1) as if working locally (1)</li> <li>to provide a secure extension of their private network (1) into an insecure environment such as the internet for workers (1)</li> <li>to separate the traffic of different user groups (1) over their underlying network with strong security features (1)</li> </ul>	[4]			

Que	stion	Gd	Expected Answer	Marks	Additional Guidance
Que 12	(c)	Gd	<ul> <li>Expected Answer</li> <li>Describe how the BCS could support the network manager.</li> <li>up to date information about ICT (1) prevents being out-of-date (1)</li> <li>regular briefings (1) on specific interests (1)</li> <li>conferences (1) meeting like-minded individuals/discussing latest topics (1)</li> <li>meetings with colleagues (1) prevents isolation (1)</li> <li>access to website/listing members directory (1) local contacts for help and assistance (1)</li> <li>help with legal advice (1) specific law related to IT (1)</li> <li>subject specific books on certain issues (1) produced by known/trusted authors (1)</li> <li>newsletter (1) round up of news (1)</li> </ul>	Marks	Additional Guidance  Max 3 for list of points
			Continued Professional Development (1) training courses providing recognised qualification (1)	[6]	

Q	Expected	Answer	Marks	Additional Guidance
13	Discuss 1	the use of software based training for this purpose.		
	The quali	ity of your written communication will be assessed in your answer to this question.		
	This is a banded response with 4 levels.			
	9-11 4	The candidate is able to discuss clearly the impact and consequences. Candidates will show a detailed level of understanding and be able to explain in detail both the impacts and consequences of more than one position.  Logical arguments are produced to demonstrate a clear understanding of the question. Ideas will be expressed clearly and fluently using specific knowledge to support and inform the discussion.  There may be a reasoned conclusion.  Subject specific terminology will be used accurately and appropriately.  The candidate is able to discuss the impact(s) and consequences(s)  Candidates will show a limited understanding and be able to explain, at least one impact and associated consequence of a given position, however explanations may lack specific		
	3-5 2	detail and/or concentrate on either an impact or consequence with a limited explanation of the other.  Subject specific terminology will be used accurately and appropriately.  The candidate is able to explain the impact(s) or consequences(s)  Candidates will show a limited understanding and be able to explain, at least one impact or consequence of a given position, however explanations may lack specific detail.		
	0-2 1	The explanation, though informed, may stray from the point but specific knowledge will be evident.  Some subject specific terminology will be used.  The candidate is able to describe superficially the impact <b>or</b> consequences. The information may be poorly expressed and may be in the form of a list of points. Subject specific terminology may be limited or missing.		

Q	Expected Answer	Marks	Additional Guidance
13	Points for discussion may include for example;		
	user names and IDs to record progress and module completion		
	automatic marking of submitted assignments		
	multimedia		
	own pace learning		
	differing learning styles		
	interactive quizzes		
	Possible Impacts may include for example:		
	feedback to individual student to indicate whether answers are correct or not		
	feedback to the tutor so progress and module completion can be monitored		
	individual assignment setting and deadlines		
	self motivation		
	Possible Consequences for discussion may include for example;		
	overview of progress, strengths and weaknesses		
	identification of areas of specification students are finding difficult to guide extra teaching		
	pre-assessment to structure learning pathway		
	ability to repeat modules until correct		
	geography of learning, not limited to the classroom		
	extension work		
	target setting		
	planning and preparation of materials		
	tutor access not always available		
	monotonous style of delivery, can lack variance	[11]	

Q	Expected	I Answer	Marks	Additional Guidance
14	Discuss	hardware and software developments that will enable the wedding outfitter to do this.		
	The qual	ity of your written communication will be assessed in your answer to this question.		
	This is a l	panded response with 4 levels.		
	9-11 4	The candidate is able to discuss clearly the impact and consequences. Candidates will show a detailed level of understanding and be able to explain in detail both the impacts <b>and</b> consequences of more than one position.  Logical arguments are produced to demonstrate a clear understanding of the question. Ideas will be expressed clearly and fluently using specific knowledge to support and inform the discussion.  There may be a reasoned conclusion.		
	6-8 3	Subject specific terminology will be used accurately and appropriately.  The candidate is able to discuss the impact(s) and consequences(s)  Candidates will show a limited understanding and be able to explain, at least one impact and associated consequence of a given position, however explanations may lack specific detail and/or concentrate on either an impact or consequence with a limited explanation of the other.		
	3-5 2	Subject specific terminology will be used accurately and appropriately.  The candidate is able to explain the impact(s) or consequences(s)  Candidates will show a limited understanding and be able to explain, at least one impact or consequence of a given position, however explanations may lack specific detail.  The explanation, though informed, may stray from the point but specific knowledge will be		
	0-2 1	evident. Some subject specific terminology will be used. The candidate is able to describe superficially the impact <b>or</b> consequences. The information may be poorly expressed and may be in the form of a list of points. Subject specific terminology may be limited or missing.		

Q	Expected Answer	Marks	Additional Guidance
14	Possible points to discuss may include for example;		
	bar codes/microchips/smart labels on goods		
	hand held scanners		
	computerised screening/sorting/conveying		
	operational control		
	on-line tracking		
	SatNav		
	GPS systems		
	route planning software		
	tracker systems in delivery vehicles		
	mobile phones		
	on-screen signatures	[11]	

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