

Advanced GCE Information and Communication Technology

Unit G063: ICT Systems, Applications and Implications - Medium banded Candidate style answer

OCR has produced these candidate style answers to support teachers in interpreting the assessment criteria for the new GCE specifications and to bridge the gap between new specification release and availability of exemplar candidate work.

This content has been produced by senior OCR examiners, with the input of Chairs of Examiners, to illustrate how the sample assessment questions might be answered and provide some commentary on what factors contribute to an overall grading. The candidate style answers are not written in a way that is intended to replicate student work but to demonstrate what a “good” or “excellent” response might include, supported by examiner commentary and conclusions.

As these responses have not been through full moderation and do not replicate student work, they have not been graded and are instead, banded “medium” or “high” to give an indication of the level of each response.

Please note that this resource is provided for advice and guidance only and does not in any way constitute an indication of grade boundaries or endorsed answers.

Section A

Attempt all the questions in this section.

These are learnt response questions; they are not contextualised although if the candidate was to give appropriate examples they would gain credit.

1 State five stages of the systems cycle	[1]
<i>Candidate style answer</i>	<i>Examiner's commentary</i>
Analysis Design Development Coding/Create Testing	This is a list of the stages, nothing more. Development and coding/create are the same stage. 4 marks

2 Describe the user interface design tool known as the ‘Model Human Processor’.	[4]
<i>Candidate style answer</i>	<i>Examiner's commentary</i>
This is where a message appears on screen, the user sees it, remembers seeing it before, thinks about what it means and what they did last time, forms an action to deal with the message and completes the action.	This is a learnt response, there are five stages to the MHP – stimulus, decoded, memory, response and action. The use of an example is valid. 4 marks

3(a) Describe the characteristics of a virtual network. [4]	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
A network is a group of computers connected together for the purposes of communication. A virtual network a network that does not exist, it is an imagined network that only exists in the mind of the computer.	There are two definitions of virtual network, the use of either in the answer is acceptable. This response gives the definition of a network (no marks) and the virtual aspect is also worth no marks. 0 marks

3(b) Describe how a mobile satellite phone network operates. [4]	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
The phone has an antenna and sends and received a signal from a satellite .	This is a learnt response. The line of sight is important. There is nothing specific about satellite phones in this response. 0 marks

4(a) Explain the importance of standards for communicating between devices. [2]	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
Different standards means that the data may not be able to be interpreted when it is received, it may not be understood.	This is a short question, it is after the importance of standards. Two points need to be made. This answer makes one point 1 mark

4(b) Describe the characteristics of an intranet. [2]	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
An intranet is an Internet that is only available inside a company. It can include email and forms to fill in.	This requires a straight definition of an intranet. This answer is weak but just has enough detail for the two marks. 2 marks

5(a) Explain what is meant by an expert system and describe its components. [4]	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
An expert system is a computer system that pretends to be like a human expert - you ask it questions and it responds with more questions or an answer. The components are: knowledge base, inference engine and user interface.	There are two parts to the answer – what is an expert system and description of the three components. The components are identified and not described. 2 marks

5(b) Identify one other way, apart from expert systems, in which ICT assists operational and strategic decision making. [1]	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
A management information system)	This is an identification only but does not say how it does it so cannot be awarded the mark. 0 marks

5(c) Identify three internal resources of a system. [3]	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
Three internal resources are human, technological and accommodation.	These are three straight learnt responses. 3 marks

6 Discuss the advantages and disadvantages of implementing a solution using off-the-shelf software rather than producing custom-written software. [6]	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
<p>It is possible to go into a shop, purchase the software and have it up and running within a few hours. Custom written takes time to write and it could be months before it is ready to use.</p> <p>The off the shelf software has a very large user base. This means there will be a large amount of support available with books, people and user groups on the Internet. With custom written the support is likely to only be available from the developers and this will be expensive.</p> <p>There are some disadvantages - it is likely that the final application will not do exactly what you want it to do. Not all the facilities you require will be there.</p> <p>An off the shelf system will contain many features that you do not require..</p>	<p>This is an advantage, but only described.</p> <p>This is an advantage but only described.</p> <p>A discussion requires a balanced approach, this means advantages and disadvantages. This is a disadvantage but only described.</p> <p>This is a second disadvantage but only identified.</p> <p>Overall, there are descriptions, both positive and negative but it does not go into detail. This is a middle band response but because of the lack of depth, it is the bottom of the middle band.</p> <p>3 marks</p>

7 The British Computer Society is one example of a professional body associated with ICT. [3] (a) Describe the purpose of such a professional body.	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
<p>The purpose of the BCS is to provide exams and books for its members that help them keep up to date.</p>	<p>This is a learnt response on the purpose. There is a list given with no depth.</p> <p>1 mark</p>

7(b) State one advantage and one disadvantage of belonging to such a body. [2]	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
<p>Advantage: They will receive regular communications including updates on their profession.</p> <p>Disadvantage: It is expensive to join and can become restrictive - must belong to get a job.</p>	<p>This is a state response.</p> <p>2 marks</p>

Section A Total [40]

Section B

Questions 8-14 concern a company which produces gardening tools such as spades, forks, rakes, hoes and wheelbarrows.

This part of the paper requires contextualisation of the answers from the candidate. Attempt all the questions in this section.

<p>8(a) A company is to create a stock control system to help in their factory producing gardening tools. The systems analysts produce a requirements specification and a design specification.</p> <p>Describe the contents of:</p> <p>(i) the requirements specification [4]</p>	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
A list of objectives signed by the end user.	This is a question that ties in with G064 and their experience of the project. Identification of the contents is all that is required, at least 4. Only one has been given 1 mark

<p>(ii) the design specification [4]</p>	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
This will contain the hardware and software that are required to run the end system on. It will also contain data structures, input forms, query designs and report layouts.	This is a question that ties in with G064 and their experience of the project. Identification of the contents is all that is required, at least 4. 4 marks

<p>(b) The analysts decide to use a project planning tool to help them with this project. Identify and describe one tool available for project planning. [3]</p>	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
A Gantt chart.	The description of the tool must match the identification. There is one mark for the identification and two for the description. Without the identification no marks can be awarded. There is no description, identification only. 1 mark

<p>9 The company already uses both batch and real-time processing systems. Discuss the differences between these two types of processing giving examples of how the company might use each system. The quality of your written communication will be assessed in the answer to this question. [9]</p>	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
<p>Real time is where the information is processed as soon as it is received. Batch processing is where the information is processed at a pre determined point in time.</p> <p>With real time systems, the information is updated immediately. With batch the update is only applied at a given time.</p> <p>Batch processing can be used for wage calculations. Real time is needed for stock control.</p>	<p>This particular question is an extension of the comparison – it is necessary to identify a characteristic and then investigate how that feature applies to batch and real time.</p> <p>This is a low response, identification of characteristics of the two systems with no depth to the answer.</p> <p>3 marks</p>

<p>10 The company already has networks of computers in place between the offices, the factory floor and the warehouse. (a) The offices use a peer-to-peer network. Management would like the whole company to go onto a client-server system. Describe the advantages and disadvantages of each system to the company. [6]</p>	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
<p>Peer to peer - the advantages The system is relatively inexpensive to set up. There is no need for a specialist network manager.</p> <p>Peer to peer - the disadvantages The machines are connected to each other and can communicate.</p> <p>Client - server - the advantages There is a central control point for updates to anti virus.</p> <p>Client - server - the disadvantages Technical expertise is required to set up and maintain the network.</p>	<p>This is a description of the advantages and disadvantages of peep to peer TO THE COMPANY. It is necessary that there is some contextualisation. The advantages are not descriptions but identifications. The disadvantages are a description of peer-to-peer and gain no marks. This is a description of the advantages and disadvantages of client server TO THE COMPANY. It is necessary that there is some contextualisation. The advantages and disadvantages are not descriptions but identifications. There are four elements to this question and all need to be covered to gain the marks.</p> <p>0 marks</p>

<p>(b) When the goods leave the factory warehouse the drivers of the lorries use a Global Positioning System (GPS) to help them reach their destination.</p> <p>(i) Describe GPS. [2]</p>	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
<p>GPS is a system which uses satellites and a receiver. A device on the ground receives signals from the satellite. It uses this information and maps within it to pinpoint a location on the surface of the planet.</p>	<p>This is a textbook description of how GPS works. There must be a minimum of two elements.</p> <p>2 marks</p>

<p>(ii) Describe how satellite communications systems are used to enable GPS. [4]</p>	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
<p>The GPS satellite sends data about its location. The receiver then takes the signals from the satellites and triangulates its own position.</p>	<p>This is a description of how GPS works, but it must be focused on the use of the satellite in the process. This does not have detail and does not achieve any of the marking points.</p> <p>0 marks</p>

<p>(c) The drivers are also able to communicate with the company network using Bluetooth ® technology. Describe Bluetooth ®. [2]</p>	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
<p>Bluetooth is a wireless protocol that works over a short range from a fixed or a mobile device, such as a phone, that allows the creation of wireless personal area networks.</p>	<p>A straightforward description of Bluetooth. A learnt response.</p> <p>2 marks</p>

11	<p>Some of the employees who work in the factory will need to be trained to use the computers.</p> <p>(a) A firm of consultants is employed to decide what methods might be best for training.</p> <p>Describe different methods of dialogue that the consultants might have considered including interaction between computer and person.</p> <p style="text-align: right;">[5]</p>
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<i>Candidate style answer</i>	<i>Examiners commentary</i>
<p>Different methods of dialogue include forms, speech and text. Forms dialogue includes boxes for the user to fill in and form controls such as option buttons, drop down lists and spinners. A speech dialogue interface involves the user talking to the computer, usually with a reduced command set. The computer can also respond with speech and noise.</p>	<p>This requires identification of the methods and a description of the methods. There should be some indication of suitability of the methods as well. This response identifies the methods and gives some description but there is no link with the considerations.</p> <p>2 marks</p>

(b)	<p>The training will help the employees to adapt to the new methods of production that the management of the company is thinking of introducing.</p> <p>Explain ways in which software based training methods can be used to help employees cope with changing work practices.</p> <p style="text-align: right;">[4]</p>
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<i>Candidate style answer</i>	<i>Examiners commentary</i>
<p>Computer Based Training can be used so that the employee can go through the new system at their own pace and even at home. Different methods are used - text, video and sound and modules of the training can be repeated as often as required. There are also interactive tests which give instant feedback.</p>	<p>This requires identification of the method and then an investigation into how that particular method helps the employees. This only gives identification of the method and does not go on to give the second part of the response required.</p> <p>2 marks</p>

<p>12 The company is expanding and will soon have branches overseas. They consider having their database system distributed across the different company sites.</p> <p>(a) Explain three different ways in which distributed databases can be stored in more than one physical location. [6]</p>	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
<p>The entire database could be duplicated across each physical location. Every one at each location has access to all the data.</p> <p>The database could be held centrally with an index being sent to each physical location. Only the data that they need to access is then transmitted to the location and any updates and changes are immediately transmitted back to the central location.</p> <p>The data could be horizontally or vertically partitioned..</p>	<p>This is theoretical – three different methods need identifying and additional information given. Two are explained and the third only identified.</p> <p>4 marks</p>

<p>(b) Explain security issues of distributing the databases and methods of overcoming these issues. [6]</p>	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
<p>Physical access to the data - if the data is stored in more than one location this gives additional entry points to the system for individuals. There is a need to physically secure the system, this can be done through the use of cameras and guards.</p> <p>There is a problem with virus's these can delete data or transfer it to the public domain. The system needs to ensure that all data being sent, all data received and all data stored are subjected to virus checks.</p> <p>Hackers are a danger, with the increase in traffic it becomes easier for them to hack in and retrieve data. There are now multiple points of access. The company needs to ensure all software is patched, staff are training on the use of passwords, audit records are regularly checked and access levels imposed.</p>	<p>These should be linked to the methods given in (a) however, any distribution will contain these security risks. There are two parts to the question, the security risk and how it can be overcome.</p> <p>6 marks</p>

<p>13 A new computer-based system is to be installed in the warehouses of the company to help load goods onto lorries more efficiently.</p> <p>(a) Describe two different methods the company could use to install this new system. [4]</p>	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
<p>Parallel could be used. This is where the old and the new system are run together.</p> <p>Direct could also be used. Direct is where the old system is stopped and immediately the new system is introduced.</p>	<p>This is a description of two different methods. Parallel only gets one mark as there is no indication of an end point for the changeover.</p> <p>3 marks</p>

<p>(b) Explain three different types of maintenance required during the life of this system. [6]</p>	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
<p>Adaptive maintenance is required if there are changes in working practices, this could be legal changes, equipment changes or changes within the company.</p> <p>Corrective maintenance is the repair of any bugs in the system.</p> <p>Perfective maintenance is improving aspects of the system - new search algorithms that could be used to speed up a search or moving a commonly used option closer to the main option.</p>	<p>This is identification of the three types of maintenance with further expansion.</p> <p>6 marks</p>

<p>(c) Describe two factors which should be considered when managing this change. [2]</p>	
<i>Candidate style answer</i>	<i>Examiners commentary</i>
<p>The most important is staff capability. This is making sure that there is appropriate training for the staff so that they will be confident when using the new system. Training them will also reassure them that their job is safe and they will be needed for the new system.</p>	<p>This is the support during the changeover. There is some overlap between changeover during the SLC process and the support during installation.</p> <p>2 marks</p>

<p>14 Discuss hardware and software developments which may change the way the company runs in the future. You should consider the sales force, warehouse workers and factory production methods in your answer.</p> <p>You should not limit yourself to existing systems and the way in which they could be advanced but allow an imaginative approach given possible trends and directions of hardware and software development in the future.</p> <p>The quality of your written communication will be assessed in the answer to this question.</p>	<p>[13]</p>
<p><i>Candidate style answer</i></p>	<p><i>Examiners commentary</i></p>
<p>There is some scope for development in the delivery system. The computers could be used to plan and plot delivery routes making the best use of fuel, traffic accidents and timing. The company could link the GPS system to an automated driving system. This would allow the vehicles to follow the route and drive for longer hours as the computer system would not get tired.</p> <p>The customers could use a 3D modelling system combined with virtual reality to look at the products before they buy them. They could see them in 3D, rotate them to see all sides and sizes before ordering.</p> <p>The human element could be completely removed from the process - the order is completed online, the selection then done from the warehouse by robots and the packing done through an algorithm to determine the most cost effective and use of least packaging to wrap the purchase. This is then transferred to the vehicle and delivered.</p> <p>The use of virtual reality and networking means that if employees are required in the warehouse, to drive the vehicles or pick items, then they could in fact be at home in a VR immersion suit which gives them the impression of being at work. They could do their job by controlling a robot.</p>	<p>This is partly already in place and a potential new development that is not commercially available.</p> <p>This is a different aspect of the company. The new development is linked to changes to the company.</p> <p>This is a change in work practices.</p> <p>This is an impact on the staff working in the company.</p> <p>Overall, it covers new technology and its impact on the company and employees, including changes to the way the company runs. The impacts however are not developed. There are however no disadvantages or negative impacts given, the essay is very one sided. This places it into the middle band and because of the lack of development of the impacts, the lower end of the middle band.</p> <p>6 marks</p>

Section B Total [80]

Overall Total [120]