



**GCE**

**ICT**

Unit **G063**: Systems, Applications and Implications

Advanced GCE

**Mark Scheme for June 2015**

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This mark scheme is published as an aid to teachers and students, to indicate the requirements of the examination. It shows the basis on which marks were awarded by examiners. It does not indicate the details of the discussions which took place at an examiners' meeting before marking commenced.

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.

OCR will not enter into any discussion or correspondence in connection with this mark scheme.

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## Annotations

Annotation	Meaning
	Omission mark
	Benefit of doubt
	Cross
	Follow through
	Not answered question
	Benefit of doubt not given
	Repeat
	Tick
	Too vague
BP	Blank Page
NR	No Response
L1	Level 1 banded response
L2	Level 2 banded response
L3	Level 3 banded response
	Level 4 banded response
SEEN	Use to indicate response (or lack of) has been seen and considered

Question	Answer	Marks	Guidance								
1	<p>One mark per identification, two marks per description. Max 2 per grouped answer if no identification</p> <p><u>Meetings</u>(1) e.g.</p> <ul style="list-style-type: none"> <li>Groups of workers are gathered together (1) questions can be asked directly/ideas expressed/points discussed(1)</li> </ul> <p><u>Document analysis</u> (1) e.g.</p> <ul style="list-style-type: none"> <li>Documents from the (current) system are used (1) and the format of input/output is identified(1)</li> </ul> <p><u>Observation</u> (1) e.g.</p> <ul style="list-style-type: none"> <li>The systems analyst watches/shadows a worker performing their job (1) to record the processes that take place (1)</li> </ul>	[6]	<p>Do <b>not</b> accept either interviews or questionnaires</p> <p>Documents on its own is too vague.</p>								
2	<table border="1" data-bbox="369 738 1294 879"> <tr> <td>4</td> <td><b>Two complete</b> comparisons</td> </tr> <tr> <td>3</td> <td><b>One complete</b> comparison and <b>one individual</b> point</td> </tr> <tr> <td>2</td> <td><b>One complete</b> comparison</td> </tr> <tr> <td>1</td> <td><b>One individual</b> points about either side</td> </tr> </table> <p>Answers may include e.g.</p> <ul style="list-style-type: none"> <li>Video conferencing will need a trainer to be available at the time the training takes place whereas online tutorials may use pre-recorded material</li> <li>Video conferencing with a trainer allows participants to ask questions whereas online tutorials do not allow questions to be asked by the trainee</li> <li>Online tutorials are available at any time that suits the trainee whereas video conferencing has to take place at a mutually agreeable time for both parties</li> <li>Both online training tutorials and videoconferencing will require access to a high bandwidth internet connection for streaming media to be delivered</li> </ul>	4	<b>Two complete</b> comparisons	3	<b>One complete</b> comparison and <b>one individual</b> point	2	<b>One complete</b> comparison	1	<b>One individual</b> points about either side	[4]	Comparison can focus on similarities as well as differences.
4	<b>Two complete</b> comparisons										
3	<b>One complete</b> comparison and <b>one individual</b> point										
2	<b>One complete</b> comparison										
1	<b>One individual</b> points about either side										
3	<p>Adaptive maintenance (1)</p> <ul style="list-style-type: none"> <li>E.g. An organisation's needs may change (over time) (1) because of external changes such as new legislation/change in e.g. VAT rate (1)</li> </ul> <p>Perfective maintenance (1)</p> <ul style="list-style-type: none"> <li>E.g. The system performance may need to be improved (1) so changes will be made to improve the work rate/adding shortcuts (1)</li> </ul>	[6]	<p>Do <b>not</b> accept corrective maintenance</p> <p>No marks to be awarded if an identification has not been made</p>								

Question	Answer	Marks	Guidance												
4	<p>Two from e.g.</p> <ul style="list-style-type: none"> <li>• Television programmes can be received at most geographical locations (1) because satellite receiver dishes just need line of sight to a broadcasting satellite transmission (1)</li> <li>• A wide range of channels can be broadcast by satellite (1) because satellite bandwidth is high enough to do so (1)</li> <li>• Satellite transmissions can be encrypted (1) because the signal is transmitted digitally (1)</li> </ul>	[4]													
5	<table border="1" data-bbox="367 592 1505 903"> <tbody> <tr> <td data-bbox="367 592 501 727">High</td> <td data-bbox="501 592 595 727">5-6</td> <td data-bbox="595 592 1505 727">The candidate has identified positive point(s) and negative point(s) with reason(s) for the impact of digital television on television companies. There is a reasoned conclusion.</td> </tr> <tr> <td data-bbox="367 727 501 799">Medium</td> <td data-bbox="501 727 595 799">3-4</td> <td data-bbox="595 727 1505 799">The candidate has identified point(s) with reason(s) for the impact of digital television on television companies.</td> </tr> <tr> <td data-bbox="367 799 501 871">Low</td> <td data-bbox="501 799 595 871">1-2</td> <td data-bbox="595 799 1505 871">The candidate has identified points for the impact of digital television on television companies.</td> </tr> <tr> <td data-bbox="367 871 501 903"></td> <td data-bbox="501 871 595 903">0</td> <td data-bbox="595 871 1505 903">Not worthy of credit</td> </tr> </tbody> </table> <p>Answers may include e.g.</p> <ul style="list-style-type: none"> <li>• Pay per view may increase revenues from one-off events but might decrease revenues from routine subscriptions</li> <li>• Interactive voting may mean extra spending on alternative programme endings but could increase the popularity of a show</li> <li>• Camera angle choice will increase popularity of coverage but requires monitoring of each camera operator</li> <li>• Interactive recording and live pause are attractive to customers but may result in loss of advertising revenue from companies who are worried that viewers will skip the adverts if shows are not watched live</li> </ul>	High	5-6	The candidate has identified positive point(s) and negative point(s) with reason(s) for the impact of digital television on television companies. There is a reasoned conclusion.	Medium	3-4	The candidate has identified point(s) with reason(s) for the impact of digital television on television companies.	Low	1-2	The candidate has identified points for the impact of digital television on television companies.		0	Not worthy of credit	[6]	
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Question		Answer			Marks	Guidance
6	a	High	5-6	The candidate has identified positive point(s) and negative point(s) with reason(s) for each as a result of creating a home network There is a reasoned conclusion.		
		Medium	3-4	The candidate has identified point(s) with reason(s) for creating a home network		
		Low	1-2	The candidate has identified points(s) for creating a home network		
			0	Not worthy of credit		
		<p>Answers may include e.g.</p> <ul style="list-style-type: none"> <li>• An internet connection can be shared saving costs but there will be a performance trade off if different users within the family access high bandwidth applications simultaneously</li> <li>• Hardware devices such as a printer can be shared which reduces costs and this allows more to be spent on one high quality device</li> <li>• A central data store for music / images would allow streaming to all machines on the network but this would have an impact on the machine acting as a media server</li> <li>• Configuration will mean that some technical knowledge will be required and someone in the household will have to gain this knowledge</li> </ul>			[6]	
	b	<p>Two from e.g.</p> <ul style="list-style-type: none"> <li>• A peer-to-peer network will be less expensive (1) because there is no need to purchase an additional server (1)</li> <li>• A peer-to-peer network will be simpler to set up (1) because it requires less technical knowledge to do so and can be done via software wizards (1)</li> <li>• A peer-to-peer network will have no reliance upon a central server (1) so if a computer goes wrong only the shared resources on that computer will be lost / no extra space is required to store the server (1)</li> </ul>			[4]	Only accept answers that fit the context of a home peer to peer network. Eg. DO NOT accept May need to employ network manager

Question		Answer	Marks	Guidance												
7	a	e.g. Optical (Fibre optic) (1) strands of glass (1) Wireless (1) radio waves (1) Cable (1) made from copper (1)	[2]	If the identification is not present a mark for a description cannot be awarded.  Do not accept WiFi/Ethernet												
7	b	Answers may include e.g.  Quality will be reduced (1) and implication e.g. sound may lose sync/video may freeze (1) video conferencing requires streaming in real time (1) to prevent buffering/lag (1)	[2]													
8		<table border="1"> <tbody> <tr> <td>High</td> <td>5-6</td> <td>The candidate has explained in detail why the employees are asked to sign a code of conduct</td> </tr> <tr> <td>Medium</td> <td>3-4</td> <td>The candidate has explained advantage(s) of the employees signing a code of conduct</td> </tr> <tr> <td>Low</td> <td>1-2</td> <td>The candidate has identified advantage(s) of the employees signing a code of conduct</td> </tr> <tr> <td></td> <td>0</td> <td>Not worthy of credit</td> </tr> </tbody> </table> <p>Answers may include e.g.</p> <ul style="list-style-type: none"> <li>• The code of conduct will set boundaries that employees are expected to adhere to so that the company can be confident that employees will act in the best interest of the company which will improve the companies standing and reputation</li> <li>• The company will be justified in exercising its right to take appropriate disciplinary action if an employee breaks the code of conduct without fear of the employee claiming unfair action</li> <li>• Employees will know what their rights and responsibilities are so they know what the company expects and the company then knows that the employees are aware of this</li> </ul>	High	5-6	The candidate has explained in detail why the employees are asked to sign a code of conduct	Medium	3-4	The candidate has explained advantage(s) of the employees signing a code of conduct	Low	1-2	The candidate has identified advantage(s) of the employees signing a code of conduct		0	Not worthy of credit	[6]	
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10	<p data-bbox="367 975 568 1007">Three from e.g.</p> <ul data-bbox="412 1043 1413 1398" style="list-style-type: none"> <li>• Expertise (1) to ascertain training requirements (1)</li> <li>• Cost (1) additional expenditure on training/hardware/software required (1)</li> <li>• <u>Cost benefit</u> (1) comparison of cost and advantages gained (1)</li> <li>• Budget (1) can they purchase with <u>money allocated (or equivalent)</u> (1)</li> <li>• Time (1) can it be completed in time allocated (1)</li> <li>• Compatibility (1) will new system work with existing system (1)</li> <li>• Timing(1) avoid peak times of the year e.g. financial year end (1)</li> <li>• Personnel (1) are personnel on board with the change (1)</li> <li>• Efficiency (1) is there a need/would there be an improvement (1)</li> <li>• Training (1) staff need to know how to use the system</li> </ul>	[6]													

Question		Answer	Marks	Guidance
11	a	<p>Four from e.g.</p> <p>Combo box / Drop-down (1) to make sure data is entered from a valid list of options (1)</p> <p>List box (1) to allow one or more options to be selected from a valid list of options (1)</p> <p>Option / Radio buttons (1) to make sure only one choice can be made from a mutually exclusive list (1)</p> <p>Spinner/Slider control (1) to allow selection from a numeric range in in fixed intervals (1)</p> <p>Check box (1) to allow for the selection or deselection of an option (1)</p> <p>Menu (1) to select range of options (1)</p> <p>Scroll bar (1) to move up/down/left/right (1)</p>	[4]	Do not accept buttons or text box.
	b	<p>Two from e.g.</p> <ul style="list-style-type: none"> <li>• Colour (1) can be adjusted to improve readability (1)</li> <li>• The font size (1) should be large enough and clear enough (1)</li> <li>• Auditory feedback (1) so that sounds play when an action is performed to confirm that the action has taken place (1)</li> </ul>	[4]	
	c	<p>Four from e.g.</p> <p>Perception: The user will have preconceived ideas (1) about how the system should operate (1) and these should be designed into the system (1) visual or audio stimuli can be used to indicate positive or negative factors (1) e.g. Green for good, Red for bad (1)</p> <p>Memory: The user will associate the actions (1) triggered by certain icons with similar systems (1) so icons such as printer icons (1) should perform the implied action (1) so that the system performs as the user expects (1)</p> <p>Learning: Prior learning must be taken into account (1) which can be done by making sure the system is consistent with other systems the user may frequently use (1)</p>	[4]	Candidates can give 4 points from a single mark point and still be awarded full marks.
	d	<p>Four from e.g.</p> <p>A user needs to be able to predict the likely behaviour of operations within the application (1) so the interface must reflect the way in which the majority of users will expect it to function (1) to ensure that functions are completed successfully (1) to increase confidence in the use of the system (1) which will reduce training times and costs (1) otherwise the user will experience difficulty learning and operating the application (1) which can increase training times and costs (1)</p>	[4]	

Question	Answer	Marks	Guidance
12	<pre> graph TD     Start([START]) --&gt; Display[/Display login screen/]     Display --&gt; Clicked{ 'Forgot Password? Clicked?' }     Clicked -- No --&gt; Display     Clicked -- Yes --&gt; Recognised{ User ID recognised? }     Recognised -- No --&gt; Error1[/Error message - UserID not known/]     Error1 --&gt; Display     Recognised -- Yes --&gt; Ask[Ask password reminder question]     Ask --&gt; Answer{ Answer correct? }     Answer -- No --&gt; Error2[/Error message - incorrect answer/]     Error2 --&gt; Display     Answer -- Yes --&gt; Send[Send reminder email to user's email address]     Send --&gt; Stop([STOP])     </pre>	[5]	<ul style="list-style-type: none"> <li>• The login screen is displayed as an output and a loop is present to monitor for the clicking of the 'Forgot Password?' button (1)</li> <li>• A decision is made to test if a recognised User ID has been entered, and, if not, an error message is output and then the process returns to the login screen (1)</li> <li>• A security question is asked and a decision is made to test if the answer to the security question is correct, and, if not, an error message is output and then the process returns to the login screen (1)</li> <li>• If the answer to the security question is correct a reminder email is sent to the user (1)</li> <li>• The diagram looks like a flow diagram (different symbols for input/output, processes and decisions) with recognisable and consistent symbols including Start and Stop connectors (1)</li> </ul>

Question	Answer	Marks	Guidance								
13	Two from e.g. <ul style="list-style-type: none"> <li>• Data redundancy is removed (1) because normalisation removes fields that can be calculated from other data fields in the database/reduced storage requirements (1)</li> <li>• Data integrity is increased (1) because there will not be duplicates of the same groups of fields (1)</li> <li>• Data consistency is increased (1) because there is no data redundancy (1)</li> <li>• Maintenance / expansion is made simpler (1) because data that is atomic is easier to extract (1)</li> </ul>	[4]	Removes redundancy(1) and duplication(1) are two answers, often provided together. Do not mark third answer.								
14	Normal <ul style="list-style-type: none"> <li>• data that is correct/should not generate errors when it is entered (1)</li> </ul> Extreme <ul style="list-style-type: none"> <li>• data that is correct but that lies at an upper/lower boundary of a range (1)</li> </ul> Erroneous <ul style="list-style-type: none"> <li>• data that is incorrect/will cause an error e.g. out of range (1)</li> </ul>	[3]									
15	<table border="1" data-bbox="369 837 1294 981"> <tr> <td>4</td> <td><b>Two complete</b> comparisons</td> </tr> <tr> <td>3</td> <td><b>One complete</b> comparison and <b>one individual</b> point</td> </tr> <tr> <td>2</td> <td><b>One complete</b> comparison</td> </tr> <tr> <td>1</td> <td><b>One individual</b> points about either side</td> </tr> </table> <p>Answers may include e.g.</p> <ul style="list-style-type: none"> <li>• A direct changeover has no interim period where the old and new systems are both running whereas parallel does</li> <li>• A direct changeover has a greater degree of uncertainty and a possibility of catastrophic failure whereas a parallel changeover allows confidence to be gained in the accuracy of the new system</li> <li>• A parallel changeover will incur greater staff cost as both the old and the new system are in operation at the same time whereas a direct changeover does not incur these costs</li> </ul>	4	<b>Two complete</b> comparisons	3	<b>One complete</b> comparison and <b>one individual</b> point	2	<b>One complete</b> comparison	1	<b>One individual</b> points about either side	[4]	If the point is the same / different for both then the candidate must explain why it is for both to gain marks for both
4	<b>Two complete</b> comparisons										
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Question			Answer	Marks	Guidance
16	a	i	<p>Answers may include e.g.</p> <ul style="list-style-type: none"> <li>Each local site has control of its data (1) and this means that Promote-U's local branches will hold and control data regarding the clients relevant to them (1)</li> <li>Most queries will be executed more quickly (1) because more data is held locally (1)</li> </ul>	[4]	
16	a	ii	<p>One from e.g.</p> <ul style="list-style-type: none"> <li>Duplicated database (1) where each office (1) has an entire copy of the database (1)</li> <li><u>Central database with local index</u> (1) where the office will store an index that can be searched locally (1) and then data retrieved via communication links from the central office (1)</li> <li>Vertical partitioning (1) would mean certain fields (1) are stored at a particular office (1)</li> </ul>	[3]	No marks to be awarded if a correct identification has not been made
16	b		<p>Four from e.g.</p> <p>Without communication between computers information cannot be exchanged (1) and for communication to take place the computers must agree upon a common language (1) and a standard acts as an agreed set of rules to facilitate a common language (1) which allows different devices from different suppliers to integrate successfully (1) standards may be <i>de jure</i> e.g. International Standards Organisation or <i>de facto</i> (1) protocols allow handshaking to take place (1) and protocols allow error checking methods to be agreed upon (1)</p>	[4]	
17			<p>Two from e.g.</p> <ul style="list-style-type: none"> <li>Technological resources (1) are the hardware/software that the organisation uses (1) to conduct its business e.g. computers and peripherals (1)</li> <li>Accommodation resources (1) are the buildings the organisation owns (1) where the employees work (1)</li> </ul>	[4]	Do not award marks for human resources

18	i		<p>One from e.g.</p> <ul style="list-style-type: none"> <li>• Financial changes such as a change in the VAT rate / minimum wage (1)</li> <li>• A change in legislation e.g. employee rights (1)</li> </ul>	[1]	
18	ii		<p>Three from e.g.</p> <p>(Change in VAT Rate) would mean adaptive maintenance would be required (1) to adjust the software to reflect the new VAT Rate (1) which would incur the expense of support / programming staff time (1)</p> <p>(Change in employee legislation) would necessitate different working practices (1) that may need contracts to be altered (1) which could incur costs to the business such as taking on extra staff (1)</p>	[3]	The explanation must relate to the point identified in 18a

Question	Answer		Marks	Guidance
19	9–11	<p>4 The candidate will explain in detail the developments in computer technology that might impact Promote-U's security supported by relevant examples.</p> <p>Ideas will be expressed clearly and fluently using specific knowledge to support and inform the discussion. Subject specific terminology, where used, will be accurate and appropriate. Spellings, grammar and punctuation will be used correctly.</p>		
	6–8	<p>3 The candidate will explain the developments in computer technology that might impact Promote-U's security.</p> <p>Subject specific terminology, where used, will be accurate. For the most part spellings, grammar and punctuation will be used correctly.</p>		
	3–5	<p>2 The candidate will describe the developments in computer technology that might impact Promote-U's security.</p> <p>Subject specific knowledge will be evident and some subject terminology will be used. There may be occasional errors in spelling, grammar and punctuation.</p>		
	1–2	<p>1 The candidate is able to identify relevant points related to the developments in computer technology on security.</p> <p>Subject specific terminology may be limited or missing. Errors of grammar, punctuation and spelling may be intrusive.</p>		
		<p>0 Not worthy of credit</p>		
<p>Points may include e.g.</p> <ul style="list-style-type: none"> <li>• Bring Your Own Device (BYOD). The increased prevalence of employees using their own devices and storing data on their own devices.</li> <li>• Miniaturisation of technology makes industrial espionage harder to detect</li> <li>• Increased computing power and distributed processing being used to crack encryption codes</li> <li>• A move to more employees being online with more access to company resources increasing the number of potential attack points</li> <li>• Improved biometric systems for user authentication</li> </ul>			[11]	

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