

GCE

ICT

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

Advanced GCE

Mark Scheme for June 2014

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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
BP	Blank Page – this annotation must be used on all blank pages within an answer booklet (structured or unstructured) and on each page of an additional object where there is no candidate response.
A	Omission mark
BOD	Benefit of doubt
C	Subordinate clause/Consequential error
X	Cross
E	Expansion of a point
FT	Follow through
NAQ	Not answered question
NBOD	Benefit of doubt not given
P	Point being made. Use to annotate level of response questions. No tick or cross should appear on these pages.
REP	Repeat
/	Slash
✓	Tick. On tick per mark. Number of ticks on response must agree with mark given. NB. No ticks should be used on level of response questions.
TV	Too vague
0	Zero (big). Use to show that you have seen the response where N/R has been given.

Subject-specific marking instructions

ADDITIONAL OBJECTS: You **must** annotate the additional objects for each script you mark. If no credit is to be awarded for the additional object, please use annotation as agreed at the SSU, likely to be 'seen' or the highlighting tool.

CROSSED OUT, RUBRIC ERROR (OPTIONAL QUESTIONS) AND MULTIPLE RESPONSES

Crossed-out Responses: Where a candidate has crossed out a response and provided a clear alternative then the crossed out response is not marked. Where no alternative response has been provided, examiners may give candidates the benefit of the doubt and mark the crossed out response where legible.

Rubric Error Responses – Optional Questions: Where candidates have a choice of question across a whole paper or a whole section and have provided more answers than required, then all responses are marked and the highest mark allowable within the rubric is given. (*The underlying assumption is that the candidate has penalised themselves by attempting more questions than necessary in the time allowed.*)

Multiple Choice Question Responses: When a multiple choice question has only a single, correct response and a candidate provides two responses (even if one of these responses is correct), then no mark should be awarded (as it is not possible to determine which was the first response selected by the candidate). *When a question requires candidates to select more than one option/multiple options, then local marking arrangements need to ensure consistency of approach.*

Contradictory Responses: When a candidate provides contradictory responses, then no mark should be awarded, even if one of the answers is correct.

Short Answer Questions (requiring only a list by way of a response, usually worth only **one mark per response**): Where candidates are required to provide a set number of short answer responses then only the set number of responses should be marked. The response space should be marked from left to right on each line and then line by line until the required number of responses have been considered. The remaining responses should not then be marked. Examiners will have to apply judgement as to whether a 'second response' on a line is a development of the 'first response', rather than a separate, discrete response. (*The underlying assumption is that the candidate is attempting to hedge their bets and therefore getting undue benefit rather than engaging with the question and giving the most relevant/correct responses.*)

Short Answer Questions (requiring a more developed response, worth **two or more marks**): If the candidates are required to provide a description of, say, three items or factors and four items or factors are provided, then mark on a similar basis – that is downwards (as it is unlikely in this situation that a candidate will provide more than one response in each section of the response space.)

Longer Answer Questions (requiring a developed response): Where candidates have provided two (or more) responses to a medium or high tariff question which only required a single (developed) response and not crossed out the first response, then only the first response should be marked. Examiners will need to apply professional judgement as to whether the second (or a subsequent) response is a 'new start' or simply a poorly expressed continuation of the first response.

Here is the mark scheme for this question paper.

MARK SCHEME FORMAT 1

Question		Answer	Mark	Guidance
1		<p>Two for each type of software, eg:</p> <p>Operating system: to control hardware resources (1) facilitate the running of application software (1) provide a human-machine interface (1)</p> <p>Utility software: to assist in the maintenance/monitoring of the system (1) to ensure efficient operation of the hardware and software (1)</p> <p>Applications software: to allow the end user to perform productive tasks (1) eg Database to store customer records (1)</p>	[6]	Maximum 1 mark for an example of each
2		<p>Two from eg</p> <ul style="list-style-type: none"> • Discussions in meetings may lose focus (1) which means that the questions asked may not be fully answered (1) • It may be difficult to get the people involved together at the same time (1) because they have other jobs or commitments they still need to perform (1) • Some people may not speak-up or give accurate information (1) because they are concerned about what other members of the group would think (1) 	[4]	Answers will relate to limitations of having a meeting
3		<p>Four from eg</p> <p>A number of computers/processors are connected together (1) one of the computers/processors co-ordinates the distribution of the task (1) each computer/processor performs part of the task (1) results from each separate computer/processor are combined (1) each computer/processor is effectively working in parallel (1)</p>	[4]	Max 1 mark for an example

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4		<table border="1"> <tr> <td>4</td><td>Two complete comparisons</td></tr> <tr> <td>3</td><td>One complete comparison and one individual point</td></tr> <tr> <td>2</td><td>One complete comparison</td></tr> <tr> <td>1</td><td>One individual points about either side</td></tr> </table> <p>Answers may include eg</p> <ul style="list-style-type: none"> • Instant messaging offers real-time two-way communication whereas email dialogue relies upon the recipient picking up the email • Advanced instant messaging systems can allow live two-way video chat whereas email will only enable pre-recorded video attachments to be sent • Email is more suited to formal communication where an audit trail is required whereas instant messaging is not and is more suited to informal collaborative working • Instant messaging services allow users to set their status to available or off-line whereas with email you don't know the current status of the other party 	4	Two complete comparisons	3	One complete comparison and one individual point	2	One complete comparison	1	One individual points about either side	[4]	<i>If the point is the same / different for both then the candidate must explain why it is for both to gain marks for both.</i>
4	Two complete comparisons											
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2	One complete comparison											
1	One individual points about either side											
5		<p>Two from eg</p> <ul style="list-style-type: none"> • The management can target students who are underperforming (1) a report could be generated that compares current student grades with expected grades (1) extra classes could be provided (1) to improve pass rates (1) • The management could decide how to allocate teaching staff for the next academic year (1) using projected student numbers to determine the number of teaching sets that need staffing (1) • The management could decide which department budgets need monitoring (1) using a report showing the percentage of the budget spent by each department (1) 	[4]	<p>Max 3 for a single example</p> <p>The answer could be one point with 3 examples or two points with an example each.</p> <p>What information (1), what decision they make with it (1)</p>								

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6		<table border="1"> <tr> <td>High</td><td>5-6</td><td>Candidate has given detailed reasons why pilot changeover should be used for the given situation</td></tr> <tr> <td>Medium</td><td>3-4</td><td>Candidate has described advantages of using pilot changeover for the given situation</td></tr> <tr> <td>Low</td><td>1-2</td><td>Candidate has identified advantages of using pilot changeover</td></tr> </table> <p>Answers may include eg</p> <ul style="list-style-type: none"> • Limits the effect of system failure to just one branch within the organisation • If the pilot fails the cost is small compared to business-wide roll-out • If problems are found they can be corrected before implementation in other branches takes place • It is possible to evaluate the success of a pilot branch by comparing it to another branch running the old system 	High	5-6	Candidate has given detailed reasons why pilot changeover should be used for the given situation	Medium	3-4	Candidate has described advantages of using pilot changeover for the given situation	Low	1-2	Candidate has identified advantages of using pilot changeover	[6]	<p>Band 5-6 answers will have a clear line of reasoning that explains the impact to the business of the point described</p> <p>Band 3-4 answers will be descriptive and will be in context</p> <p>Band 1-2 answers will identify points</p>
High	5-6	Candidate has given detailed reasons why pilot changeover should be used for the given situation											
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7		<table border="1"> <tr> <td>High</td><td>5-6</td><td>Candidate has given a detailed positive and a detailed negative impact to the company of defining ethical standards. There is a reasoned conclusion.</td></tr> <tr> <td>Medium</td><td>3-4</td><td>Candidate has described positive or negative points to the company of defining ethical standards.</td></tr> <tr> <td>Low</td><td>1-2</td><td>Candidate has identified positive or negative points</td></tr> </table> <p>Answers may include eg</p> <ul style="list-style-type: none"> • The company may be at a competitive disadvantage when compared to competitors who do not operate ethically • Employees may resent some of the terms of the code of conduct and bear resentment toward the company • A company whose staff operate in an ethical way will be noted as a reputable company and trust will increase in the company • Clear expectations are given to employees who will then uphold a certain standard of conduct 	High	5-6	Candidate has given a detailed positive and a detailed negative impact to the company of defining ethical standards. There is a reasoned conclusion.	Medium	3-4	Candidate has described positive or negative points to the company of defining ethical standards.	Low	1-2	Candidate has identified positive or negative points	[6]	<p>Band 5-6 answers will have a clear line of reasoning that explains the impact to the company of the points described</p> <p>Band 3-4 answers will be descriptive and will be in context</p> <p>Band 1-2 will identify points</p> <p>Max 1 mark for identification of content of code of conduct.</p>
High	5-6	Candidate has given a detailed positive and a detailed negative impact to the company of defining ethical standards. There is a reasoned conclusion.											
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8		<p>Advantages eg</p> <ul style="list-style-type: none"> • So that in the event of a natural disaster a backup will exist (1), a separate off-site backup is achieved (1) • Outsourcing will mean employees can concentrate on their main jobs (1) which means the business can save on extra staff time or wages (1) <p>Disadvantages eg</p> <ul style="list-style-type: none"> • Bandwidth will be taken up for data transfer (1) which may result in higher internet service provider fees / which may slow response times for employees using the internet (1) • Hosted backup services will charge by the volume of data or the frequency of data backed up (1) which could add significant costs to the backup strategy (1) • A third party is involved which increases risks to data security (1) because there are more potential security breach points (1) 	[6]	Reason for data loss can be implied
9	a	<p>Max 2 marks for identifying hardware; Max 2 marks for describing the transmission process;</p> <p>The reporting team require a satellite modem (1) and a portable two-way satellite dish (1) that requires line of sight to a geostationary satellite (1) that will relay the signal back to a ground station on earth (hub telecommunications port) (1) where the data is then routed via terrestrial internet to 24-7 News headquarters (1)</p>	[4]	satellite/3g Other methods of communicating are possible such as satellite to satellite & cellular;
9	b	<p>Three from eg</p> <ul style="list-style-type: none"> • Battery life is limited and affects operating times (1) and requires a portable solar power charger (1) • The bandwidth speed is limited (1) which will mean video image quality will be poor with pauses (1) or will have to be at low resolution (1) • Line of sight is required (1) and there may be mountains in the way (1) • Weather patterns eg blizzards (1) can cause interference to the signal (1) • Latency delay between transmitting and receiving data (1) will make services such as video-conference communication difficult because of the time-lag during real-time interaction (1) 	[6]	Not cost – cost is not a limitation

Question		Answer	Marks	Guidance
10		<p>Two from eg</p> <ul style="list-style-type: none"> • access can be from any computer anywhere via the internet (1) which means resources can be accessed remotely (1) • because a secure logon with a username and password is required (1) only authorised employees or authorised third parties can access the company's extranet (1) 	[4]	
11	a	<p>Two from eg</p> <ul style="list-style-type: none"> • The company has a duty to comply with the Data Protection Act 1998 (1) which requires that personal data be kept securely (1) • Data within the organisation may be commercially sensitive (1) and competitors would gain an advantage if they were able to access it (1) • Damage the reputation of the company (1) if sensitive data were lost/released (1) 	[4]	
11	b	<p>Two from eg</p> <ul style="list-style-type: none"> • Security guards (1) to prevent unauthorised people from accessing systems on the company's property (1) • Locks/key codes/biometric (1) to prevent unauthorised people without the code from accessing them (1) • Surge protectors (1) as electrical power surges could cause damage to hardware (1) • CCTV (1) to allow area to be monitored (1) 	[4]	Measure may protect physical security/integrity

Question		Answer	Marks	Guidance
12	a	<p>Three from eg</p> <p>Design</p> <ul style="list-style-type: none"> During design the client can view potential interface designs (1) and comment as to whether they are acceptable or whether modifications are required (1) <p>Testing</p> <ul style="list-style-type: none"> During testing the client will be invited to perform a user test (1) that will enable the client to see if their requirements have been implemented to their satisfaction (1) <p>Installation</p> <ul style="list-style-type: none"> During installation data transfer to the new system will take place (1) and the client will enter new data or import data (1) During installation training will take place (1) and the client will be involved in the mechanics of organising training for employees (1) 	[6]	
	b	<p>Four from eg</p> <p>The project will be split into separate tasks that are assigned times (1) and the order of the tasks to be completed will be determined (1) including the identification of dependencies between tasks (1) to allow development time to be calculated (1) and decisions can then be made regarding potential staff allocation at key bottlenecks (1)</p>	[4]	
	c	<p>Two from eg</p> <ul style="list-style-type: none"> Take the requirements specification (1) and create a design specification that sets out how the requirements will be met (1) Develop a test plan (1) that can be implemented by a third party such as a tester or programmer within the team (1) 	[4]	DO NOT allow user interface design

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12	d	<p>Two from eg</p> <ul style="list-style-type: none"> • A user interface that draws on a user's previous experience will be easier to learn (1) such as using standard icons that are already likely to be known (1) • Providing helpful error messages (1) will enable the user to understand the error made thus speeding up the learning process (1) • The interface should be consistent (1) buttons in the same position so the user learns a physical response (1) • The user's expectations when performing an action are considered (1) so the system responds as they expect it to (1) 	[4]	Allow crossover between perception/past experience and learning
	e	<p>Four from eg</p> <p>If the application requires an input from the user it must stimulate the user's senses (1) which can be done via auditory or visual means (1) such as the use of a flashing error alert or a warning beep (1) which will then be cognitively processed (decoded) by the user's long term memory (1) which in turn will trigger a motor response from the user (1) such as tapping a finger on one of the error alert options displayed (1)</p>	[4]	
	f	<p>Four from eg</p> <p>RAD starts with pre-created components (1), clients requirements are met before they change or go out of date (1) as the application is split into chunks and time boxed (1) prototyping may be used (1) and feedback may be received/ iterative development (1) the client will be involved at all stages eg JAD workshops (1) the client will approve the final solution as one that meets their needs (1) the client does not have to define all of the requirements at the beginning because an iterative process is used (1) additions / changes to the requirements can be made as the project develops (1)</p>	[4]	Multiple different version is not enough, must clearly be iterative development.
	g	<p>Two from eg</p> <ul style="list-style-type: none"> • Users will be asked for their views (1) which will provide valuable feedback on the applications performance that can then be used in future updates (1) • Hardware and software developments might affect the continued working (1) and a review would highlight this so that appropriate action could be taken (1) • Reviews can assess whether the application is out-of-date (1) so that future updates can address the concerns raised (1) • External changes such as legislation may necessitate change (1) and a review will enable these issues to be raised and addressed (1) 	[4]	

Question	Answer	Marks	Guidance
13	<p>eg</p> <pre> graph TD Start([Start]) --> Input1[/Input new password/] Input1 --> Input2[/Input copy of new password/] Input2 --> Check{Check copies match} Check -- No --> PasswordMatch[Passwords must match] PasswordMatch --> Start Check -- Yes --> Calculate[Calculate password strength] Calculate --> Strong{Is the password strong?} Strong -- No --> PasswordStrong[Password must be strong] PasswordStrong --> Start Strong -- Yes --> Success[Password change successful] Success --> Stop([Stop]) </pre>	[6]	<p>Flowchart symbols may vary</p> <p>The order of the steps may vary for different valid solutions eg checking password strength before verify the password entry</p> <p>Calculation of password strength may have more steps</p>

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14		<table border="1"> <thead> <tr> <th>Band</th> <th>Mark</th> <th>Criteria</th> </tr> </thead> <tbody> <tr> <td>4</td> <td>9-11</td> <td>The candidate has identified, exemplified and explained <u>a range</u> of relevant points <u>in depth</u> considering <u>potential impacts</u>. Ideas will be expressed clearly using subject specific knowledge and terminology.</td> </tr> <tr> <td>3</td> <td>6-8</td> <td>The candidate has identified, exemplified and explained relevant points <u>in depth</u> considering <u>potential impacts</u>. Subject specific terminology will be used accurately</td> </tr> <tr> <td>2</td> <td>3-5</td> <td>The candidate has identified, exemplified and described relevant points. Subject specific knowledge will be evident and some subject specific terminology will be used.</td> </tr> <tr> <td>1</td> <td>1-2</td> <td>The candidate is able to identify a number of points. Subject specific terminology may be limited or missing.</td> </tr> </tbody> </table> <p>Possible points for discussion may, for example, include:</p> <ul style="list-style-type: none"> Reporters can report news stories live as they happen which will increase the coverage that 24-7 News can potentially provide 24-7 News and its reporters will need to decide upon which type of technology they will use for a given geographic location / environment and evaluate the relative coverage, speed, reliability, portability and cost factors 24-7 News and its reporters will have to consider how they carry and transmit potentially sensitive information Reporters in the field could access the company network remotely via a VPN to access company data so 24-7 News will need to provide the infrastructure Reporters can travel to any geographical area, however remote, and be able to send news stories to the company 	Band	Mark	Criteria	4	9-11	The candidate has identified, exemplified and explained <u>a range</u> of relevant points <u>in depth</u> considering <u>potential impacts</u> . Ideas will be expressed clearly using subject specific knowledge and terminology.	3	6-8	The candidate has identified, exemplified and explained relevant points <u>in depth</u> considering <u>potential impacts</u> . Subject specific terminology will be used accurately	2	3-5	The candidate has identified, exemplified and described relevant points. Subject specific knowledge will be evident and some subject specific terminology will be used.	1	1-2	The candidate is able to identify a number of points. Subject specific terminology may be limited or missing.	[11]	<p>Band 9-11 - explained impact and consequences from more than one position (could be positive/negative). Responses will be similar to 6-8 but will have a range of points in depth. i.e. breadth and depth</p> <p>Band 6-8 - Explain impact and consequences of one position (positive or negative) OR explained range of impacts; Responses will be exemplified by the depth given to a point. The potential impact(s) to the company or employee will be clear. i.e. depth</p> <p>Band 3-5 - Explain impact or consequence OR describe range of impacts. Responses will describe a range of relevant points but the depth of analysis of potential impacts will be missing</p> <p>Band 1-2 – Identify. Responses are likely to consist of a list of points</p>
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