# OCR
Oxford Cambridge and RSA

# GCE

# ICT

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

Advanced GCE

# Mark Scheme for June 2018

Oxford Cambridge and RSA Examinations

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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.

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**Annotations**

| Stamp | Ref No. | Annotation Name | Description |
|:---:|:---:|:---:|:---:|
| | 151 | Highlight | Highlight (mandatory for all units) |
| | 181 | Off Page Comment | Off page comment (mandatory for all units) |
| ^ | 261 | ^ | Omission mark |
| ✔ | 11 | Tick | Tick |
| TV | 201 | TV | Too vague |
| REP | 271 | REP | Repeat |
| NBOD | 191 | NBOD | Benefit of doubt not given |
| NAQ | 501 | NAQ | Not answered question |
| ✖ | 21 | Cross | Cross |
| BOD | 31 | BOD | Benefit of doubt |
| SEEN | 811 | SEEN | Noted but no credit given (Added later) |
| {V wavy line} | 1381 | V Wavy Line | Extendable vertical wavy line (Added later) |
| {H wavy line} | 1371 | H Wavy Line | Extendable horizontal wavy line (Added later) |

| Question | | | Answer | Marks | Guidance |
|---|---|---|---|---|---|
| 1 | | (i) | Two from e.g.<br><br>More than one task/program/instruction running at the same time (1)<br>Processor executes instructions from one task/process before switching to the next task/process (1)<br>Processes tasks rapidly to give appearance of being done at same time (1)<br>Divides system resources amongst tasks (1) | [2] | Allow examples of multiple tasks at the same time (1) |
| 1 | | (ii) | Two from e.g.<br><br>One user at a time (1)<br>Can run multiple programs at a time (1)<br>Can have multiple profiles (1) | [2] | |
| | | | | | |
| 2 | | | Two from, two marks per limitation e.g.<br><br>• Only work with a limited vocabulary (1) some will not be recognised (1)<br>• Background noise may also cause interference (1) words cannot be recognised (1)<br>• Different accents may not be understood (1) and may require systems to be 'trained' to the individual's voice (1)<br>• Trained voices can alter (1) for example if the user has a cold (1) | [4] | Accept either voice based or typed natural language interfaces |
| | | | | | |
| 3 | | | Two from, two marks each:<br><br>The visual image store (1) is held in the short term working memory (1)<br><br>Long term memory is referenced (1) to execute/ decode the image (1)<br><br>The motor processor then triggers a muscle movement / output (1), which reinforces muscle memory / clicks correct option on box (1) | [4] | |

| Question | | | Answer | Marks | Guidance |
|---|---|---|---|---|---|
| 4 | | | Any four from e.g.<br><br>(Phone number is dialled and) BTS sends number of caller and number of receiver to BSC (1)<br>BSC forwards information to MSC (1)<br>MSC routes call to receivers MSC (1)<br>Receivers MSC identifies where the receivers phone is and forwards call to BCS / of phone not online then sent to voicemail (1)<br>BSC forwards call to BTS(1)<br>BTS forwards call to phone (1)<br>Phone being called receives the request and acknowledges it (1)<br>If accepted, it is connected, and a frequency assigned for the voice call (1) | [4] | Allow *annotated* diagrams<br><br>Note that this is from once the number has been dialled. |
| 5 | a | | <table><tr><td>High</td><td>5-6</td><td>Candidate has explained a positive **and** a negative impact on employees. There is a reasoned conclusion.</td></tr><tr><td>Medium</td><td>3-4</td><td>Candidate has described positive **and/or** negative point(s) of the impact on employees.</td></tr><tr><td>Low</td><td>1-2</td><td>Candidate has identified positive or negative points.</td></tr></table><br>Answers may include e.g.<br><br>• Employees have greater freedom to work from different locations such as at home or whilst commuting, and so have greater flexibility over how they work. They can access work files and can continue working collaboratively with their colleagues.<br>• Employees may feel pressure to keep checking work emails to see if there is anything urgent that needs to be attended to. This can increase stress levels and make it harder to maintain a work-life balance that may be detrimental to family life. | [6] | 5 marks can be awarded without a conclusion.<br><br>4 can be awarded for a positive or negative explanation on its own.<br><br>3 can be awarded for a positive or negative description on its own.<br><br>2 more than 1 point.<br><br>1 identify a single point. |

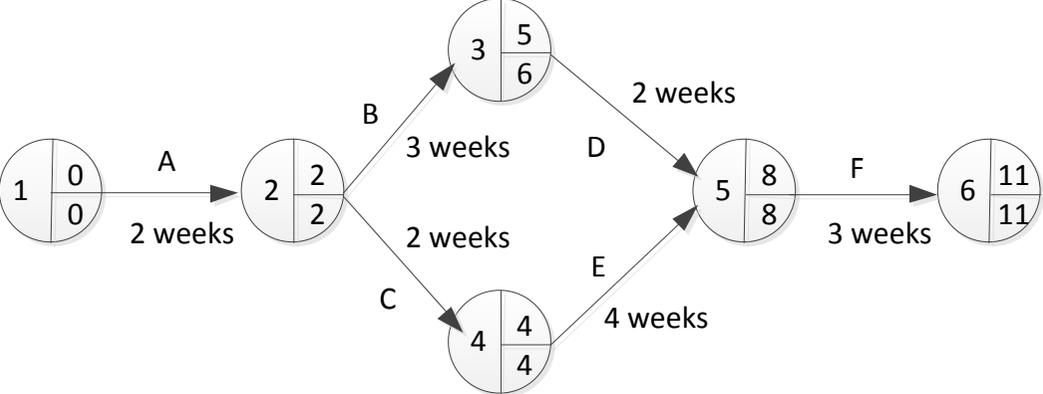| Question | | | Answer | Marks | Guidance |
|---|---|---|---|---|---|
| **5** | b | | Two from, two marks each e.g.<br><br>• Running many applications can drain battery (1) devices need to be recharged frequently (1)<br>• Security is reliant upon the employee (1) and portable devices can easily be lost / left unattended (1)<br>• Access to a high bandwidth connection will be required if a number of applications are to run in real-time (1) and mobile connections are less reliable/available than fixed connections. (1)<br>• Some tablet computers have a small screen size to aid portability (1) and this means that viewing information and control of the interface can be difficult (1) | [4] | |
| | | | | | |
| **6** | | | <table><tr><td>High</td><td>5-6</td><td>Candidate has explained why an off-the-shelf package would be used in a library.</td></tr><tr><td>Medium</td><td>3-4</td><td>Candidate has described why an off-the-shelf package would be used in a library.</td></tr><tr><td>Low</td><td>1-2</td><td>Candidate has identified points regarding why an off-the-shelf package would be used in a library.</td></tr></table><br>Answers may include e.g.<br>• The system will be available immediately which means it can be installed and the library can be functional when the school opens. Library systems are common to many institutions.<br>• The cost of the system is likely to be far less as the development costs are shared between many different users/libraries. This will save the school money compared to a custom written solution.<br>• There is likely to be more support such as online groups, frequent product patches / updates and training courses since there will be a large user base using the system. Many libraries will use the product and staff moving between different libraries are likely to have familiarity with the key software features. | [6] | Should all be positive reasons why.<br><br>Single point described/explained in medium or high can be awarded full marks in that band. |
| | | | | | |

| Question | | | Answer | Marks | Guidance |
|---|---|---|---|---|---|
| **7** | a | | Two from, three marks each:<br><br>Central database with (remote) local indexes (1st)<br>• the database is stored at a central location e.g. the Chain headquarters (1)<br>• indexes are held at each local site/hotel (1)<br>• data is then retrieved from the central database (1)<br>Vertically Partitioned (1st)<br>• different fields are stored at different hotel sites (1)<br>• each hotel can only access some of the fields (1)<br>• some of the fields (1) all of the records (1)<br>Replicated/duplicated database(1st)<br>• Entire copy (1)<br>• Located at each site (1)<br>• Every hotel can access all the records locally (1) | [6] | No marks to be awarded if there is no identification.<br><br>Do not award marks for horizontal partitioning<br><br>Not just partitioning<br><br>Allow suitably labelled diagrams |
| | | | | | |
| **7** | b | | Two from:<br><br>Data stored is accurate (1) and complete (1) and reliable (1)<br>Multiple copies (1) of the same data item are consistent (1) | [2] | |
| | | | | | |

| Question | | | Answer | Marks | Guidance |
|---|---|---|---|---|---|
| **8** | | | Four from e.g.<br><br>• Room needs to be booked (1)<br>• Agenda written (1)<br>• Refreshments organised (1)<br>• Meeting time and date circulated (1) by email / other suitable method (1)<br>• Replies consolidated (1) so attendees known (1) | [4] | Any suitable consideration for planning a meeting.<br><br>Allow four individual points or expansions – descriptions, not advantages of disadvantages. |
| | | | | | |
| **9** | a | | Two from, two marks each e.g.<br><br>• meeting (1) to contribute their views (1)<br>• interviews (1) to answer questions as to how the system currently operates/use open and closed questions (1)<br>• questionnaires (1) to determine how they rate the current system/reach wide audience (1) | [4] | Not document analysis |
| | | | | | |

| Question | Answer | Marks | Guidance |
|---|---|---|---|
| 9 b |  Recognisable and consistent symbols have been used for Entities, Processes and Data Stores (1)<br><br>Three separate processes for phone call bookings, web-based bookings and confirmation letters are identified (1)<br><br>Receptionist and Customer external entities are identified at the start (1)<br><br>The booking records are identified as a Data Store (1)<br><br>The data flows are labelled and show a logical flow from Entity → Process → Data Store → Process → Entity (1) | [5] | Allow slight variation in the symbols used, but symbols should be consistent |

| Question | | | Answer | Marks | Guidance |
|---|---|---|---|---|---|
| **9** | c | | Two from, three marks each e.g.:<br><br>Perception/mental model (1st)<br>   o  Users will have preconceived ideas of how the interface should work (1) e.g. such as red meaning 'stop' and 'green' meaning 'go' (1)<br>Memory (1st)<br>   o  Remember where buttons/options are on different screens (1) consistent screen layout (1)<br>Learning (1st)<br>   o  On screen help messages (1) should be clear to assist rapid learning of the system (1)<br>Language (1st)<br>   o  Novices (1) will require the language to use non-technical terms for it to be understandable (1)<br>Colour (1st)<br>   o  Certain colours or combinations of colours cannot be used (1) without some users being disadvantaged / colour blindness (1) | [6] | No marks to be awarded if there is no identification.<br><br>Do not award marks for attention |
| | | | | | |
| **9** | d | | Three from e.g.<br><br>• create the code for the application (1)<br>• Meet the design specification (1)<br>• modify existing code/fix bugs (1)<br>• test the code produced/develop test plan (1)<br>• produce technical documentation/code comments/online help (1) | [3] | |
| | | | | | |
| **9** | e | | Two from, two marks each e.g.<br><br>• Allow the management to see how different variables (1) such as the month affect occupancy (1)<br>• Reports can be tailored to find specific information (1) by running queries such as when are the periods of low occupancy (1)<br>• Help management make decisions (1) such as when to run promotional offers (1)<br>• Allow trends to be spotted (1) such as bookings per month (1)<br>• Reduces time spent analysing data (1) allows speedy decisions for urgent situations | [4] | Can be linked to an example as an expansion or a straight advantage.<br><br>Not uses/examples of an MIS on their own |

| Question | | | Answer | Marks | Guidance |
|---|---|---|---|---|---|
| | | | (1)<br>• Avoids information overload (1) only relevant data is presented (1)<br>• Provides data in an appropriate form (1) graphs for visual representation (1) | | |
| **9** | f | | Two from, three marks each e.g.<br><br>Staff capability (1st)<br>• Staff may need retraining (1)<br>• content / timing of the training must be considered (1)<br>Staff views (1st)<br>• Staff need to be consulted (1)<br>• Opinions heard/taken into account (1)<br>• So that they feel valued (1)<br>Systems and Equipment (1st)<br>• Data transfer – volume/timing (1)<br>• Purchase of new equipment (1)<br>• Method of changeover (1)<br>Accommodation (1st)<br>• New equipment / staff may necessitate more physical space (1)<br>• or installation of additional power points (1) | [6] | No marks to be awarded if there is no identification – some flexibility of an identification. |
| **9** | g | | Two from, e.g.<br><br>Bugs in the system may have come to light since installation (1)<br>Code will need to be changed so that the system will work (1) | [2] | |

| Question | | | Answer | Marks | Guidance |
|---|---|---|---|---|---|
| **10** | a | | <br><br>B → D and C → E are completed in parallel and followed by F (1)<br>Each Earliest Start Time (EST) is correctly calculated<br>   5/4,8,11 (1)<br>Each Latest Finish Time (LFT) is correctly calculated<br>   6/4,8/11 (1) | [3] | |
| | | | | | |
| **10** | b | | A → C → E → F (1) | [1] | |
| | | | | | |
| **10** | c | | <u>11</u> Weeks | [1] | |

| Question | | | Answer | Marks | Guidance |
|---|---|---|---|---|---|
| 11 | a | | Two from, two marks each e.g.<br>Advantage:<br>A leased line has no contention ratio (1) which means that performance will be guaranteed (1)<br>Increased/high bandwidth (1) higher volume of data transferred (1)<br>A leased line can be upgraded (1) which future proofs the connection if the business' needs change (1)<br>Only user of the line (1) increased security (1)<br>A leased line is asymmetric (or can be varied) (1) so the demands of the business to upload data can be met (1)<br><br>Disadvantages<br>The (installation/ongoing) cost of a leased line is high (1) and this cost has to be borne by the business (1)<br>A leased line has to be physically installed (1) which can cause disruption as cables have to be laid (1)<br>Have to wait for it be installed (1) survey required/wait for engineer (1) | [6] | |
| 11 | b | | <table><tr><td>High</td><td>5-6</td><td>Candidate has explained why Ambridge Manor would install a dedicated file server on its network.</td></tr><tr><td>Medium</td><td>3-4</td><td>Candidate has described why Ambridge Manor would install a dedicated file server on its network.</td></tr><tr><td>Low</td><td>1-2</td><td>Candidate has identified points regarding why Ambridge Manor would install a dedicated file server on its network</td></tr></table><br>Points may include e.g.<br>• Data stored is more secure as the file server can use redundant hard disks so no single disk failure can cause data loss. This will ensure that the business can continue to function if one drive on the server fails.<br>• The network administrator can set up separate storage space for each employee as well as shared areas for different departments. Quotas can be enforced to make sure that the resource is shared fairly amongst the users.<br>• The file server administrator can set the permission levels for each file / folder such as read/write permissions to make access to files more secure. This can help the company to meet its commitments to keep data secure under the DPA. | [6] | Should all be positive reasons why.<br><br>Single point described/explained in medium or high can be awarded full marks in that band. |

| Question | | | Answer | Marks | Guidance |
|---|---|---|---|---|---|
| 11 | c | | Two from, two marks each e.g.<br><br>• Encryption (1) to ensure that only those people with the key can decipher and read the data (1)<br>• Passwords (1) to control access to files (1)<br>• Firewall (1) prevents unauthorised <u>external</u> access (1)<br>• Access rights (1) limits access one in the system (1)<br>• Virus checking (1) to prevent malicious software accessing data (1) | [4] | Must be software based |
| | | | | | |
| 11 | d | | <table><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><br>Points may include e.g.<br><br>• The staff WiFi network is closed and only accessible to authorised uses via a username and password whereas the guest WiFi network can be open and not need a username and password<br>• Both the staff WiFi network and the guest WiFi network will allow access to the Internet via the company webserver and will use the same TCP/IP protocols<br>• The staff WiFi network will allow access to internal resources such as the internal company email which will not be accessible through the guest WiFi network | [4] | *If the point is the same for both*<br><br>*or different for both then the*<br><br>*candidate must explain, for*<br><br>*both, why it is for both to gain*<br><br>*marks for both.* |
| | | | | | |

| Question | | | Answer | Marks | Guidance |
|---|---|---|---|---|---|
| **11** | e | | Two from, two marks each e.g.<br><br>• Contact group / distribution list (1) one email can be sent to many (1)<br>• Attachments (1) documents can be shared between employees (1)<br>• Auto response (1) instructions for an alternative contact in case of emergency (1)<br>• Shared calendar (1) so that meetings can be arranged when both parties are free (1) | [4] | Not send and receive |
| | | | | | |
| **12** | | | Three from, two marks each e.g.<br><br>• Templates (1) that will ensure that predefined layouts are applied e.g. letterheads (1) so all standard documents follow a consistent appearance (1)<br>• Macros (1) that will apply page formatting commands automatically (1)<br>• A style sheet (1) to determine the appearance of headings and sub-headings (1)<br>• A master slide (1) set up for different slide types (1)<br>• An external CSS for web pages (1) can be set up to define the appearance and layout of the pages on the site (1) | [6] | This is not the items in the house style, but how it can be applied. |
| | | | | | |

| Question | Answer | Marks | Guidance |
|---|---|---|---|
| **13** | <table><tr><td>Band</td><td>Mark</td><td>Criteria</td></tr><tr><td>3</td><td>8-11</td><td>The candidate has explained a number of relevant impacts. Subject specific terminology will be used accurately and appropriately.</td></tr><tr><td>2</td><td>4-7</td><td>The candidate has described a number of relevant impacts. Subject specific knowledge will be evident and some subject specific terminology will be used.</td></tr><tr><td>1</td><td>1-3</td><td>The candidate has identified a number of relevant impacts. Subject specific terminology may be limited or missing.</td></tr></table><br><br>Points may include e.g.<br><br>• Biometric identification at check-in or for room access / access to hotel resources<br>• Control of the room environment through use of a smartphone / tablet<br>• Entertainment systems / facilities provided by the hotel e.g. lighting/mood backgrounds on walls<br>• Robots for room service / porter service<br>• Digital signage in the hotel<br>• Automated lighting systems based on sensors | [11] | Identification of hardware/software could be in the body of the answer. |

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