Rewarding Learning

ADVANCED
General Certificate of Education
2014

Information and Communication Technology

Assessment Unit A2 1

assessing

Module 3: Information Systems

[AP211]

MONDAY 2 JUNE, MORNING

MARK SCHEME

General Marking Instructions

Introduction

Mark schemes are published to assist teachers and students in their preparation for examinations. Through the mark schemes teachers and students will be able to see what examiners are looking for in response to questions and exactly where the marks have been awarded. The publishing of the mark schemes may help to show that examiners are not concerned about finding out what a student does not know but rather with rewarding students for what they do know.

The purpose of Mark Schemes

Examination papers are set and revised by teams of examiners and revisers appointed by the Council. The teams of examiners and revisers include experienced teachers who are familiar with the level and standards expected of students in schools and colleges.

The job of the examiners is to set the questions and the mark schemes; and the job of the revisers is to review the questions and mark schemes commenting on a large range of issues about which they must be satisfied before the question papers and mark schemes are finalised.

The questions and the mark schemes are developed in association with each other so that the issues of differentiation and positive achievement can be addressed right from the start. Mark schemes, therefore, are regarded as part of an integral process which begins with the setting of questions and ends with the marking of the examination.

The main purpose of the mark scheme is to provide a uniform basis for the marking process so that all the markers are following exactly the same instructions and making the same judgements in so far as this is possible. Before marking begins a standardising meeting is held where all the markers are briefed using the mark scheme and samples of the students' work in the form of scripts. Consideration is also given at this stage to any comments on the operational papers received from teachers and their organisations. During this meeting, and up to and including the end of the marking, there is provision for amendments to be made to the mark scheme. What is published represents this final form of the mark scheme.

It is important to recognise that in some cases there may well be other correct responses which are equally acceptable to those published: the mark scheme can only cover those responses which emerged in the examination. There may also be instances where certain judgements may have to be left to the experience of the examiner, for example, where there is no absolute correct response – all teachers will be familiar with making such judgements.

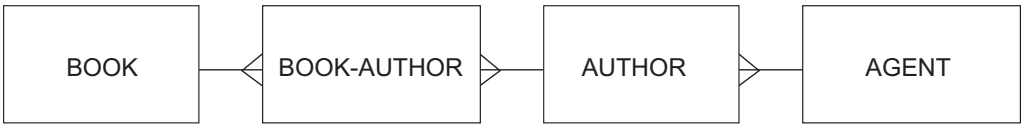
				AVAILABLE MARKS
1	**(a)**	There is a controlling/dedicated network server The server services requests/clients make requests for resources Clients are dumb terminals/have minimal resources There is central control of security [1] for each of four points	[4]	
	(b)	Data is encoded … before transmission … using a special key/algorithm On receipt, the data is converted back to its original form Intercepted data is meaningless without the key [1] for each of four points	[4]	
	(c)	A checksum function is applied ... to a number of bytes/a block of data The check sum is sent as part of the data It is recalculated after data transmission If the checksum is incorrect, there is an error in the data The data can be retransmitted Some types of checksum may automatically correct the error [1] for each of four points	[4]	
	(d)	Portions of the database ... are stored at a number of different locations within the network Each location stores that portion of the database they need to access frequently The DBMS synchronises the database at regular intervals [1] for each of four points	[4]	
	(e)	There is only a <u>single copy</u> of the database ... so synchronisation/data maintenance/data backup is more efficient [1] for each of two points The database is at a <u>single location</u> ... so security/data access can be managed more effectively [1] for each of two points [2] each of two advantages	[4]	20

2 **(a)** Data inconsistency
An attribute or field has more than one value
... as it will be stored in more than one table or file
[1] for each of two points

Data independence
Stored data is separate
... from the programs/software which accesses/manipulates it
[1] for each of two points

Data integrity
The accuracy
or reliability
or completeness of the data
[1] for each of two points [6]

(b)



[1] for each of four entities
[1] for each of three relationships [7]

(c) Hardware
... such as processor/external memory/printers
[1] for each of **two** points

Software
... such as database management system
[1] for each of **two** points

Personnel
... such as analysts/DBA/programmers
[1] for each of **two** points [6]

AVAILABLE MARKS

19

AVAILABLE MARKS

3 **(a)** It creates a model of the new system
... including DFDs
... and ERDs
[1] for each of two points

Templates of standard modelling shapes can be used
... to improve productivity/quality
[1] for each of two points

Designs can be validated
... automatically/correctness can be ensured
[1] for each of two points

Design elements can be used to populate the data dictionary
... automatically
Entries can then be edited
[1] for each of two points

Designs can be reused
...and adapted/modified for other projects
[1] for each of two points

[2] for each of two features [4]

(b) Assists/automates planning/monitoring of the project schedule
Assists/automates calculating and monitoring the project budget
Assists/automates the creation of Gantt charts/PERT chart/critical path
Assists/automates the identification of tasks
Assist/automates the allocation of resources
Assists/automates the identification and management of risk
[1] for each of **four** points [4]

(c) <u>Alpha testing</u>
This is carried out by the developer
Module testing
… against module specifications
Integration testing
… using the system module architecture
System testing
… against the system specifications
Test schedule/test data used
[1] for each of **three** points

<u>Acceptance testing</u>
This is carried out by the eventual end users/client
They use the software using real data in realistic conditions/real volumes of data
… and provide feedback to the developers
It is the final stage before the software goes live/precursor to completion of contract
[1] for each of **three** points [6]

(d) Errors will be detected and corrected
... during corrective maintenance
... errors not detected during system testing
[1] for each of two points

The performance of the system will be improved
... during perfective maintenance
Example: faster processor to decrease response times
[1] for each of two points

Additional functionality will be added
... during adaptive maintenance
Example: new reports required by the user/changes required by new legislation
[1] for each of two points [6]

AVAILABLE MARKS

20

				AVAILABLE MARKS
4	**(a)**	Provides the management reports ... required to manage an organisation efficiently/achieve its goals It aggregates data from a range of sources ... internal and external Example: data processing systems Performs financial analysis/business modelling [1] for each of **four** points	[4]	
	(b)	Strategic [1] Made by directors/CEO Long-term planning decisions/setting organisation objectives [1] for one point Tactical [1] Made by middle management Medium term planning decisions [1] for one point Operational [1] Made by supervisors/operatives/shop-floor workers Day to day/operational decisions [1] for one point	[6]	
	(c)	The user interface [1] The user keys in facts about the problem/answers questions about the problem ... and receives a solution to the problem/an explanation of the solution [1] for each of **two** points The knowledge/rule base [1] This contains information/expert knowledge about the problem domain ... and heuristics/rules about the problem domain [1] for each of **two** points The inference engine [1] Applies the rules ... and draws conclusions It may apply fuzzy logic [1] for each of **two** points	[6]	16

AVAILABLE MARKS

5 **(a)** An intranet is a private/restricted network
... for company employees
The Internet is a worldwide network
... which can be used by anyone with appropriate HW and SW
[1] for each of **four** points [4]

(b) So that users cannot install software/load files directly onto the network
... so that network security cannot be bypassed/licences infringed
[1] for each of **two** points

It will reduce the risk of the network being infected by viruses
... accidentally/deliberately
[1] for each of **two** points

It will prevent data being copied onto the devices
... which might infringe Data Protection legislation/the data might be stolen by a competitor
[1] for each of **two** points

It will prevent software being copied onto the devices
... which might infringe copyright laws/software licences
[1] for each of **two** points

[2] for each of **two** reasons [4]

(c) Eyesight problems/eyestrain/glaucoma/migraine
... caused by looking at a computer screen for long periods
[1] for each of two points

Back pain/posture problems
... caused by sitting at a desk for long periods/using a poorly designed chair
[1] for each of two points

RSI/muscular problems/carpal tunnel/in the wrist
... caused by prolonged use of a keyboard or mouse
[1] for each of two points

Radiation damage/skin damage/mental fatigue
... caused by being in close proximity to a screen/monitor
[1] for each of two points

[2] for each of three health problems [6]

(d) The BCS is an organisation representing IT professionals
The BCS has over 70,000 members (practitioners, businesses, academics, students) in the UK and worldwide
It is recognised by IT employers/governments
[1] for each of two points

The BCS delivers/validates a range of IT courses and training
... for beginners, home users, professionals
Members can continue their professional development/get widely recognised qualifications or training
[1] for each of two points

Members can keep up to date with developments in IT/communicate with other IT professionals/influence national IT policies
Members can join special interest groups/special interest forums
[1] for each of two points

[2] for each of two benefits [4] 18

AVAILABLE MARKS

				AVAILABLE MARKS
6	**(a)**	There is a prescribed list of command words Each command has its own syntax ... including a short word, e.g. COPY The user inputs the specific command at a prompt Some commands require parameters or switches [1] for each of four points	[4]	
	(b)	The screen layouts reflect existing data entry forms Data input boxes in the same positions Screens displaying the same text/labels/instructions The user may be able to tick boxes/use radio buttons/dropdown menus/ use of defaults/autocomplete The order in which the user completes a form may be pre-set/controlled The user may navigate using BACK/NEXT/SAVE/EDIT buttons Validation/verification will be carried out [1] for each of four points	[4]	
	(c)	The course is delivered over the Internet/an intranet/the trainee logs on Each trainee can train at convenient times/set their own pace/repeat or review previous sections/jump ahead to sections The course content is presented using multimedia/video/audio/graphics Participants may communicate with the instructor/other trainees via email/ forum/user groups/bulletin boards/videoconferencing Training may be controlled by the use of different navigation paths may be provided for different levels of trainees The progress of the trainees can be monitored/assessed electronically/ automatically [1] for each of four points	[4]	12

7 ICT terminology

AVAILABLE MARKS

Download — The movie file is downloaded and stored/saved in external memory. It can be watched later many times/without the need for an Internet connection. [1]

Real-time — The movie file is streamed using the Internet and viewing can start immediately the start of the movie has been downloaded [1]

Speed

Download — Low bandwidth means the file will take longer to download, but it will not affect the viewing experience. When the movie is watched, fast transfer speeds from the storage device are required to ensure smooth viewing. [1]

Real-time — High bandwidth is required to ensure smooth viewing. Network congestion may disrupt viewing. [1]

Capacity

Compression is used to reduce the file size/bandwidth required.
Buffering is used to minimise interruptions to viewing. [1]

Real-time — No external storage is required as the file is not saved.
Download — An external storage device is required to store the downloaded movies. [1]

Conclusion

Real-time viewing has revolutionised the way movies are viewed as on-demand viewing is possible
Mobile devices such as smart phones/tablets can be used to watch movies in real-time
The need for high capacity, fast access external memory devices is reducing but there are increasing demands on broadband capacity.

Two points @ [1]

Structure [0] [1] or [2] [10] 10

Quality of Written Communication (QWC) in GCE Mark Schemes.

The assessment of quality of written communication.

Marks are to be allocated to QWC in accordance with the following criteria.

Performance Level	Criteria	Marks
Threshold	Candidates spell, punctuate and use the rules of grammar with reasonable accuracy; they use a limited range of specialist terms appropriately.	0, 1
Intermediate	Candidates spell, punctuate and use the rules of grammar with considerable accuracy; they use a good range of specialist terms with facility.	2, 3
High	Candidates spell, punctuate and use the rules of grammar with almost faultless accuracy; deploying a range of grammatical constructions; they use a wide range of specialist terms adeptly and with precision.	4, 5

[5] 5

Total **120**

AVAILABLE MARKS