Rewarding Learning

ADVANCED
General Certificate of Education
2016

Information and Communication Technology

Assessment Unit A2 1

assessing

Module 3: Information Systems

[AP211]

MONDAY 6 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)	(i)	Perfective maintenance [1] The system is working correctly ... but its performance needs to be improved ... using developments in ICT, e.g. faster processor [1] for each of two points	[3]	
		(ii)	Corrective maintenance [1] There are errors in the system ... which were not detected during testing [1] for each of two points Adaptive maintenance [1] The user requirements have changed ... so extra functionality must be added [1] for each of two points	[6]	
	(b)	(i)	It is an iterative development process (continuous/cyclical) Users and developers take part in regular workshops/focus groups A preliminary data model/prototype/user interface is developed along with a user interface This helps verify the requirements/refine the data model/ implement the required processing There are strict deadlines set for each refinement Requirements/functionality are prioritised/categorised ... as essential/non essential [1] for each of four points	[4]	
		(ii)	Development is performed by existing resources/personnel ... so it is cost effective/they will better understand the user requirements [1] for each of two points The development team are available ... for training/implementation/support [1] for each of two points [2] for each of two benefits	[4]	17

		AVAILABLE MARKS
2 **(a)** **(i)**	A primary key uniquely identifies ... an entity occurrence in a table [1] for each of two points [2]	
(ii)	A composite key consists of two or more attributes/keys ... which may be primary keys in other tables It uniquely identifies a record [1] for each of three points [2]	
(iii)	A foreign key is a non-key field in one table ... which is a primary key in another table It creates a link between tables [1] for each of three points [3]	
(b)	Data redundancy is minimised ... as non-key data is stored only once ... thus reducing file sizes [1] for each of two points Data consistency is ensured ... so that an attribute ... cannot have conflicting/contradictory values [1] for each of two points [4]	

(c)

INF

STUDENT1	StudentID	StudentName	CourseID	CourseTitle
STUDENT-BOOK1	StudentID BookID	BookTitle	LoanDate	ReturnDate

2NF

STUDENT1	StudentID	StudentName	CourseID	CourseTitle
STUDENT-BOOK2	StudentID BookID	LoanDate	ReturnDate	
BOOK	BookID		BookTitle	

3NF

STUDENT2	StudentID	StudentName	CourseID
STUDENT-BOOK 2	StudentID BookID	LoanDate	ReturnDate
BOOK	BookID		BookTitle
COURSE	CourseID		CourseTitle

[1] for each of nine correct entities [9]

20

			AVAILABLE MARKS
3	**(a)**	The responsibilities of the DBA include: Keeping the DBMS software up to date Monitoring the performance of the database Establishing backup and recovery duties Setting access rights Managing the database users and security measures Working with the database developers to design new reports, queries [1] for each of four points [4]	
	(b)	It assists managers in solving complex business problems ... by applying different business models to data The problems may be ad hoc/complex ... or unstructured/semi-structured problems ... such as 'what if'/using goal seeking/risk analysis Assists organisations with strategic/tactical/operational decision making It may incorporate an expert system [1] for each of four points [4]	
	(c)	Mirror image backup An exact/real time copy of the data ... is stored on a second disk drive/RAID ... at a remote location [1] for each of three points An automatic switchover can take place [4] [1]	12

			AVAILABLE MARKS
4	**(a)**	The OSI model consists of an abstract/a set of specific protocols It defines a layered protocol/there are seven layers Each layer deals with specific functionality/each layer is independent of the others Control is passed from one layer to the next Each layer interacts directly only with the layer immediately beneath it ...and provides facilities for use by the layer above it Example: Name of layer Maximum [1] ... description of layer Maximum [1] [1] for each of six points [6]	
	(b)	If an odd number of bits have flipped ... an error will be detected but the number of errors will not be detected If an even number of bits have flipped ... this will not be detected [1] for each of four points [4]	
	(c)	<u>Name</u> Echo checking [1] <u>Description</u> The receiving device sends the data back to the transmitting device The transmitting device compares this data with the original data The transmitting device retransmits the data if there was an error [1] for each of four points [4]	
	(d)	Each user will be allocated access rights . . . to the data they need for their work Example of access right (Read/Write/Delete) The access rights are stored in a table When a user attempts to access the database their access rights will be checked in the table Each user has a username and password [1] for each of four points [4]	
	(e)	Data encryption Data is coded before transmission … using a special algorithm/key On receipt the data is decoded … using the same algorithm/key Intercepted data is meaningless without the key [1] for each of four points [4]	22

			AVAILABLE MARKS
5	**(a)**	Natural language Allows user to interact using written or spoken language Verbs or phrases are used . . . to instigate functionality The user's commands are compared . . . with a database of sounds . . . using speech recognition software [1] for each of three points GUI Uses windows to represent applications/tasks . . . pull-down menus to provide options . . . icons to represent objects such as programs, folders . . . a mouse to control a pointer [1] for each of three points [6]	
	(b)	Perception [1] Past experiences or intuition . . . can influence how users perceive objects Example – the use of colours to strengthen or weaken information such as 'green for go' This can influence the use of metaphors/icons [1] for each of two points Memory [1] How humans retain and recall information . . . including long-term/short-term memory The memory load on the user should be kept to a minimum/cognitive overload should be avoided Examples: the use of short menus/use of standard interface [1] for each of two points [6]	
	(c)	A user group consists of end users of a particular system/software package … who communicate via an electronic forum/bulletin board/series of meetings The user can use these post problems/queries … or start a thread [1] for each of four points [4]	
	(d)	The content can include multimedia components/video clips/sound/images to show the user how to perform tasks Example: By showing screenshots of the user interface The user can choose a personal path through the material … by selecting menu options/hyperlinks A limited amount of memory is available in the DVD player ... which can record the user's progress during the current training session In-built assessment/testing may be included [1] for each of six points [6]	22

			AVAILABLE MARKS
6	**(a)**	A touch screen is an input and output device Menu options/help is displayed on the screen A stylus may be provided The screen may be covered by a membrane which is sensitive to pressure Or there may be a line of infrared/light/lasers/sensors . . . at the corners/sides of the screen The pressure of the user's finger is detected/the finger cuts the beams The position of the location is calculated [1] for each of six points [6]	
	(b)	Robots can be programmed . . . to assemble the parts consistently [1] for each of two points Robots can perform very intricate operations . . . to a high level of accuracy [1] for each of two points Robots can be re-programmed ... to permit changes to the assembly process [1] for each of two points High initial investment required ... but running costs may be reduced [2] for each of three benefits [6]	12
7		<u>Resources</u> Organisations require fewer external memory devices as their data is stored on third party networks but they still require the ICT resources to gather, maintain and use their data The third party is responsible for security of the stored data so the organisations do not need to purchase or licence this software for themselves The organisations depend on reliable high speed broadband connections to the Internet to save and retrieve their data quickly and accurately so that it is available for their day to day operations <u>DP Legislation</u> Organisations depend on the third party complying with DP legislation but this can be difficult to ensure An organisation's data may be stored globally which makes enforcement of DP legislation difficult, for example restricting data to EU Data users find it even more difficult to discover the data held about them, where it is being held and by whom [2] for each of four substantive points [10] [0][1] or [2] for report structure	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