Rewarding Learning

ADVANCED
General Certificate of Education
2012

Information and Communication Technology

Assessment Unit A2 1

assessing

Module 3: Information Systems

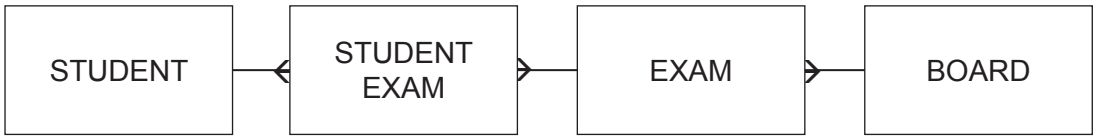
[AW211]

FRIDAY 25 MAY, MORNING

MARK SCHEME

1 (a)

AVAILABLE MARKS



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

(b) (i) A primary key uniquely identifies a record
... entity occurrence
Example: Each student has a unique StudentID/Each exam has a unique ExamID/ Each exam board has a unique ExamBoardID
[1] for each of two points [2]

(ii) A composite key consists of two or more keys/fields
... each of which may be a primary key in another table
... which together uniquely identify a record/entity occurrence
[1] for each of three points [3]

(iii) A foreign key is a referential constraint or link between two tables
A foreign key is an attribute in one table
... but is a primary key attribute in another table
[1] for each of three points [3]

(c) Data redundancy is eliminated
Each non-key attribute for an entity occurrence is only stored once in the database
This minimises the storage requirements
[1] for one point

Data consistency is ensured
An attribute for an entity occurrence will have only one value
... so there will only be one correct/current value for an attribute
[1] for one point

Improved data integrity [1]
Improved data independence [1]
[1] for each of two benefits [2]

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AVAILABLE MARKS

2 **(a)** Each shop will store data which is specific to the store/data which is most in demand at the shop
Data such as stock levels/employee timesheets
... will be accessed directly at each shop
Head office will store data which is required for overall management of the chain
Data such as supplier data/personnel data/stock prices/customer loyalty data
... will be accessed directly at head office
Each shop will download relevant data such as prices from head office
[1] for each of four points [4]

(b) Each shop is responsible for its own security
Each shop must be resourced with HW and SW to store and access its data
Each shop must have the appropriate IT personnel
Local data may be unavailable during regular synchronisation with HQ
Shared data may be unavailable during downloading from HO
[1] for each of three drawbacks [3]

(c) The single copy of the database
... is stored/located in a single location
... where all database maintenance takes place
Users access the database remotely
Users can make changes to the data remotely
[1] for each of four points [4]

(d) **Echo checking**
The receiving device sends the received data back to the transmitting device
The transmitting device can compare this data with the original
... and retransmit the data if there was an error
[1] for each of two points

Checksums
Calculated by adding together all the bytes/applying an algorithm
... in/to a block of data/packet of data
The checksum is sent as part of the data
The checksum is recalculated after data transmission
If the checksum is incorrect, the data is very likely to be in error
Some types of checksum may automatically correct the error
[1] for each of four points [6]

(e) The software will log a range of activities on the network
... such as the identity of each logged-on user
... the time each user logged on/off
... the terminal/location each user logged on to
... the files/data files/software accessed by each user
... the data modifications by each user
[1] for each of three points [3]
If authorised modifications are detected the audit records can be used to help identify who made them, from which terminal and when. [1] 21

3 **(a)** The waterfall model [1]
There is a sequence of distinct stages
Example: Analysis
One stage must be completed before next stage commences
Deliverables are produced (at end of each stage)
Example: system specification (at the end of the analysis stage)
If an error is found during one stage a previous stage may have to be reworked
[1] for each of three points

RAD [1]
It is an iterative development process (continuous/cyclical)
There is a requirements planning stage
... followed by a user design phase
Users and developers take part in regular workshops/focus groups
A preliminary data model/prototype is developed
A user interface developed
This helps verify the requirements, [1] refine the data model, [1] 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 three points

Prototyping [1]
A first-cut solution/model is developed
This is evaluated by the user
… who provides feedback to the developer
The model is repeatedly refined and evaluated
The user interface is modified/functionality is added
The iteration stops when the user is satisfied with the system
… i.e. evolutionary prototyping
… or when the user requirements have been established
… and the system can then be developed using the waterfall method
… i.e. throwaway prototyping
[1] for each of three points

[4] for each of two software development approaches [8]

AVAILABLE MARKS

(b) Graphics tool [1]
Assists the creation of DFDs, ERMs, ELHs
... using a set of standard model shapes
... which can be digitally manipulated/saved/edited/re-used
Models can be validated automatically
The DD is updated automatically
[1] for each of two points

Data dictionary generator [1]
The dictionary is automatically populated
... with entities/data flows/data stores/processes
... as models are created/modified
The dictionary can be edited digitally, e.g. detailed process descriptions inserted
[1] for each of two points

Code generator/interface generator [1]
Program code will be created automatically
... from user interface designs
... or formal module specifications
The code can be edited digitally, e.g. comments inserted
[1] for each of two points

Project management CASE tool [1]
Automates planning/monitoring of project schedule
Automates calculation/monitoring of project budget
Assists production of Gantt charts/PERT charts/CPA
Assists indentification of tasks and allocation of resources
[1] for each of two points

[3] for each of three CASE tools [9]

(c) Errors will be detected and corrected
... during corrective maintenance
The performance of the system will be improved
... during perfective maintenance
Additional functionality will be added
... during adaptive maintenance
[1] for each of six points [6]

AVAILABLE MARKS

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				AVAILABLE MARKS
4	(a)	**Form-driven** The screen layouts reflect existing paper forms ... with input boxes in the same positions ... and the same text/instructions The user may be able to tick boxes or use radio buttons The order in which the user completes the form may be controlled Validation/verification will be carried out The user may navigate using BACK/NEXT... buttons [1] for each of three points **Command line** There is a finite list of command words Each with a correct syntax The user inputs the command at a prompt Some commands require parameters or switches [1] for each of three points	[6]	
	(b)	The interface could include short cuts ... a combination of two or more keys pressed at the same time ... such as Ctrl + S for Save [1] for each of two points The interface could include function keys/hot keys ... special keys programmed to carry out specific tasks ... such as F5 for 'Find and Replace' [1] for each of two points The interface could include a CLI ... so that commands can be entered as text [1] for each of two points The user may be able to customise the interface ... by adding icons, shortcuts [1] for each of two points [2] for each of two features	[4]	
	(c)	It can incorporate multimedia elements ... such as videos/audio clips ... Example: a video to demonstrate how to use the system ... Users can use hyperlinks to navigate through the guide ... and continue where they left off and repeat parts of the training It can provide a search facility/search engine ... so users can search for specific topics by name/key words The DVD player has a limited amount of RAM ... so the trainee's progress can be stored and displayed [1] for each of six points	[6]	
	(d)	A user group is a community of users of the information system The members can share knowledge/exchange ideas about the system ... using an online forum/bulletin board/regular meetings Members create posts or threads ... about problems/solutions of common interest [1] for each of four points	[4]	20

				AVAILABLE MARKS
5	**(a)**	The user interface [1] The user keys in facts to the expert system about the problem ... and receives a solution ... and possibly a reason/explanation [1] for each of two points The knowledge/rule base [1] Contains information/heuristics, rules about the problem domain/expert knowledge Represents the knowledge of human experts [1] for each of two points The inference engine/mechanism [1] Applies the rules using the user's input ... and draws conclusions Can apply fuzzy logic [1] for each of two points	[9]	
	(b)	The consultants will be questioned ... by the expert system's designer They will explain how they make decisions about life insurance applications ... the information/data they use ... and the rules they use ... including intuition/'rules of thumb' [1] for each of four points	[4]	13
6	**(a)**	Data Controller This is the person within the organisation ... responsible for ensuring compliance with the legislation ... he/she determines the purposes for which the data is processed ... and the way in which the data is processed ... and monitors how data is processed [1] for each of three points	[3]	
	(b)	Can view the data an organisation holds on them for a small fee Can request that incorrect information be corrected Can be compensated if their request is ignored, the request or the data concerned can be destroyed by court order Can require that data is not used in any way that may potentially cause damage or distress Can require that their data is not used for direct marketing [1] for each of four rights	[4]	
	(c)	Some data is excluded Data processed for the purpose of safeguarding national security/data processed for the prevention or detection of crime [1] for each of two points It can be difficult/time consuming/expensive to enforce the legislation ... for a data subject to find out what data is being held about them [1] for each of two points [2] for each of two limitations	[4]	11

7 How the intranet will address their concerns

AVAILABLE MARKS

What is it?
The intranet will be private to the company
... which will be accessible only to authorised users
... using usernames and passwords
[1] for each of two points

What will it provide?
It will be designed to ensure that employees have access to all the data/information/news they require
... via bulletin boards/shared network folders
... so that employees have less need to use the Internet
[1] for each of two points

What will it prevent?
It can be designed to prevent all access to the Internet
... or provide only some employees with access to the Internet
It can restrict/limit the access an employee has to the Internet
[1] for each of two points

Maximum [4]

Other steps the company could take to ensure employees make appropriate use of the Internet

The company could install a firewall and apply security criteria to prevent/restrict unauthorised external access

The company could use a proxy server to intercept all requests to the Internet and prevent employees from accessing specific web sites

The company could introduce an acceptable use policy/employee code of practice to set out the employee's responsibilities regarding the use of ICT and enforced by disciplinary procedures

The company could establish a special training programme for employees so that each employee is aware of his/her responsibilities regarding the use of the network

The company could use auditing software to monitor websites accessed by each employee and for how long

[1] for each of four substantive points (relevant point plus detail or justification)

Maximum [4]

Report Structure
Title/introduction/two sections/summary/conclusion/appropriate language
[0], [1] or [2] for structure [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