Rewarding Learning

ADVANCED
General Certificate of Education
January 2012

Information and Communication Technology

Assessment Unit A2 1

assessing

Module 3: Information Systems

[AW211]

MONDAY 23 JANUARY, AFTERNOON

MARK SCHEME

			AVAILABLE MARKS
1	**(a)**	'Off the shelf' [1] Purchase standard software off the shelf from a computer store/on-line retailer Ready made/mass produced [1] for one point Suitable method – there are standard payroll packages available [1] 'In house' [1] Develop the software in-house using software specialists/software department [1] for one point Unsuitable method – the company will not have the required expertise [1] 'Outsourcing' [1] Outsource the development of the software to a third party To a software development company [1] for one point Suitable method – the company can have the software specially designed for their needs [1] [9]	
	(b)	The course is delivered over the Internet/an intranet ... as an interactive course Each participant logs on ... at times convenient to him/her ... and sets their own pace ... and can repeat/review previous sections/jump ahead of sections The course content is presented using multimedia/video/audio/graphics Context sensitive help may be provided Participants may communicate with the instructor via email/forum/user groups Information may be disseminated to participants via bulletin boards The user navigates through the course using simple controls, e.g. Next/Back buttons ... and an interactive index Different navigation paths may be provided for different categories of users The progress of the trainees can be monitored electronically [1] for each of four points [4]	
	(c)	The payslip/salary data should be backed up when the payroll is run/ weekly/monthly Payroll data such as tax bands/rates should be backed up when they change/yearly The payroll software should be copied/backed up after installation The backup data should be copied to a portable medium ... such as a CD/DVD/external hard drive ... and stored away from the computer system An incremental backup could be used/full backup [1] for each of four points [4]	17

			AVAILABLE MARKS
2	**(a)**	There is at least one controlling/dedicated/host server ... which is a high capacity/high speed computer with a large hard disk capacity ... which serves/handles requests ... from many clients/the other nodes on the network/clients initiate requests ... for resources/services ... such as data/files/software/email/web access/storage/peripherals The server provides communication links/controls access/security [1] for each of four points [4]	
	(b)	Anti-virus software It automatically ... checks/scans all transmitted files/programs/software ... coming in to the network ... via email/attachments/the Internet/portable devices ... against a database ... of known viruses/signatures ... which is updated to keep track of new viruses ... and blocks/deletes anything identified as malicious to data, e.g. spyware ... or disinfects files/remove viruses from files Suspicious software may be quarantined/run in isolation A report detailing identified viruses is produced [1] for each of three points Firewall Monitors/checks/analyses/filters all traffic/data/communication ... entering the network ... or leaving the network It blocks/denies any messages ... which does not meet specified criteria/security policy/settings/rules It will permit access to legitimate communications It may be part of a proxy server A report detailing unauthorised attempts is produced [1] for each of three points [6]	
	(c)	The audit trail/log ... can help identify who was responsible It records who was logged on/username/IP address ... at which stations ... the log on/off times ... all access to data files/read/write operations [1] for each of three points [3]	
	(d)	Authorised users ... access rights to data files ... will be recorded in an access table When a user attempts to modify data ... the user's access rights will be checked in the access table ... to ensure they have EDIT/MODIFY/DELETE access ... and only if the user has appropriate rights will the modification be permitted [1] for each of three points [3]	16

			AVAILABLE MARKS
3	**(a)**	Normal data ... which lies within the permissible range Example: 2 for a month number [1] for each of two points Extreme data ... which lies on the boundary Example: 12 for a month number Data which is missing Example: A null value [1] for each of two points Erroneous data/null data ... which should not normally occur Example: 13 for a month number [1] for each of two points Exceptional data ... which may not 'follow the rules' but which is still valid ... such as 29th February in a leap year [1] for each of two points [2] for each of three methods [6]	
	(b)	Performed when the software is ready to be released/handed over to the client/users/after application testing Intended to give the end users the confidence that the software meets their requirements A group representing the end users tests the application ... using real world scenarios/data The users report back/provide feedback on any problems Eventually, the users sign off the software/complete the contract [1] for each of three points [3]	
	(c)	Perfective maintenance [1] The system is working correctly Improvements are implemented ... such as reduced access times/greater accuracy [1] for each of two points Adaptive maintenance [1] Additional functionality is added ... such as new user requirements ... or requirements required by external factors such as new legislation [1] for each of two points [6]	15

4 **(a)** A decision support system assists managers in solving complex business problems
It applies various business models to data
The problems may be ad hoc/complex
... or unstructured/semi-structured problems
'what if' analysis can be performed
Goal seeking
Risk analysis may be used
Assists organisations with strategic/tactical/operational decision making
[1] for each of four points [4]

(b) Rule base
Contains knowledge/heuristics/connections/facts
... about the problem domain
Derived from human experts
[1] for each of two points

Inference engine
Applies the rules
... using the user's input
... and draws conclusions
Fuzzy logic may be used
[1] for each of two points [4]

(c) The expert system can apply the knowledge of a number of very experienced car mechanics

The expert system can produce very accurate diagnoses
... and up to date diagnoses
... consistently
... and provide reasoning/probabilities
[1] for each of three points

However, it cannot replace human intuition
... for example, where a mechanic may sense or guess the problem
Humans can learn from their mistakes
Risk of over reliance on technology
Mechanics may become deskilled
[1] for three points overall max [4]

(d) **(i)** Advances in telecommunications
... such as broadband
... enable the sales team to access the company's database
... and software/applications
... using the Internet/via an intranet
... irrespective of location
... so they can work as effectively from home as from an office
The sales team can communicate
... using electronic bulletin boards/e-mails/videoconferencing
[1] for each of four points [4]

(ii) Less management control of the sales team
... as most contact will be indirect
The sales team cannot be observed directly
There may be a lack of teamwork
[1] for each of two points

The company must provide appropriate ICT resources
... such as a broadband connection/intranet
... access to databases/SW via Internet
[1] for each of two points [4]

AVAILABLE MARKS

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			AVAILABLE MARKS
5	**(a)**	A centralised database A single copy of the stock database is held at the central location Information such as prices will be updated here directly Any stock data amendments (e.g. stock levels) at each supermarket branch ... will be generated at branch level ... and communicated to the centralised database ... and the database updated [1] for each of three points A distributed database Relevant copies of part of the database will be held at each supermarket ... as that is where it will be most frequently accessed Stock data amendments will be implemented in the database at the appropriate branch The scattered scattered versions of the database must be synchronised ... to make sure they all have consistent data Each supermarket gets a daily copy of stock prices [1] for each of three points [6]	
	(b)	A rationale for the policy Defines the employer's rights/the employee's responsibilities regarding the use of ICT ... including proper use of e-mail and the Internet/how e-mail and the Internet should be used for business and personal use ... and how use of ICT such as e-mail and the Internet will be monitored and policed It will describe security procedures ... such as secure logging on and off It will prohibit actions which will compromise data security ... e.g. the use of storage devices not checked for viruses It will identify management and employees' responsibilities relating to legislation It will define the disciplinary process/appeals process ... and the penalties for non-compliance [1] for each of six points [6]	12
6	**(a)**	It automates/supports all/many project management activities ... for the planning/monitoring/controlling of the project's schedule and cost ... such as identifying/assigning/sequencing tasks and resources ... producing CPA/PERT charts/Gantt charts ... in electronic form ... which can be saved/reused ... using templates/drawing tools It may perform validation It supports electronic communication within the project team, e.g. via email/forums [1] for each of four points [4]	
	(b)	Non-key data ... is stored more than once in the database Example: titles of projects/names of Managers/Clients/Programmers This increases the memory needed to hold the database ... and increases data retrieval times ... and impacts on data integrity/data consistency [1] for each of three points [3]	

(c) **1NF** **PROJECT**

ProjectID Project ClientID Client

PROJECT PROGRAMMER

ProjectId ProgrammerID Programmer Job

[1] for each of two entities

2NF *PROJECT*

ProjectID Project ClientID Client

PROJECT PROGRAMMER 2

ProjectId ProgrammerID Job

PROGRAMMER

ProgrammerID Programmer

[1] for each of three entities

3NF **PROJECT 2**

ProjectID Project ClientID

CLIENT

ClientID Client

PROJECT PROGRAMMER 2

ProjectId ProgrammerID Job

PROGRAMMER

ProgrammerID Programmer

[1] for each of four entities [9]

AVAILABLE MARKS

16

7 **(a)** It has sufficient capacity to store a typical business application, e.g. 4.38+ GB
Data can only be written to it once so its contents cannot be accidentally erased/altered
It is light in weight so it incurs minimal postage costs
[1] for each of three points [3]

(b) The website can contain multimedia components, e.g. animations/sounds
... whereas the magazine is restricted to text and graphics
... so the website could include a demo
[1] for each of two points

The potential 'audience' is worldwide/not restricted to the magazine's readership
Any Internet user could be directed to the site via a search engine
The website is available 24/7
[1] for each of two points

The website could include an e-mail link
... so that the company could build up a database of potential users
... and contact them with promotions
[1] for each of two points

[2] for each of two advantages [4]

		AVAILABLE MARKS
(c)	Allows user to interact using written 'human' language ... or spoken commands Verbs or phrases are used ... to instigate functionality ... such as creating, selecting, modifying data The user's commands are compared ... with a database of sounds ... using speech recognition software [1] for each of three points [3]	
(d)	Introduction Software piracy is the illegal distribution and/or reproduction of software which can result in serious loss of revenue [1] Steps the company can take The company can take a number of steps to make piracy more difficult The software could be distributed in encrypted form Each copy requires a unique key or code before it can be installed When this key is used to install the software it locks the software so it cannot be installed on other computers A hardware key or dongle can be used to the same effect Special software can be used to prevent a disk from being copied The company should consider Digital Rights Management issues How effective are these methods? Automatic key generation software is widely available Disk cloning software is available [1] for each of three substantive points Legislation Piracy is punishable by law, whether deliberate or not The software will be covered by the Copyright, Designs and Patents Act ... which applies the concept of intellectual property/ownership to software ... within the United Kingdom The Act states that "an article is an infringing copy if its making constituted an infringement of the copyright in the work in question" A licence will be required for the computer game It will be illegal for anyone to copy the game without the company's permission/if not covered by a site/multiple user licence It will be illegal for anyone to distribute the software without the company's permission/an appropriate licence The penalties for breaking this Act include a term in prison and an unlimited fine The legislation is difficult to enforce The onus will be on the company to detect and prosecute offenders Support is available from the Federation Against Copyright Theft (FACT) ... which acts against counterfeiting, copyright and trademark infringements [1] for each of three substantive points [0], [1] or [2] for the report structure – Introduction, conclusion, appropriate language Maximum [9] [9]	19
	QWC	5
	Total	**120**

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