



Rewarding Learning

**ADVANCED
General Certificate of Education
2015**

**Information and Communication
Technology**

Assessment Unit A2 1

assessing

Module 3: Information Systems

[AP211]

MONDAY 1 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.

- 1 (a)** Data is stored and maintained in a single location
 Users in remote locations access the data
 ... over a WAN
 The database is maintained centrally
 Security is managed centrally
 [1] for each of four points [4]
- (b)** Data encryption
 An algorithm is applied to the data
 ... using a key
 ... before transmission of patient data
 ... and when data is received
 Data cannot be accessed without the key
 [1] for each of four points
- Access rights
 Each authorised user will be allocated access rights
 ... to the patient database
 ... according to their needs
 Example of access right (Read only/Write/Delete)
 Access rights are held in a table
 [1] for each of four points [8]
- (c)** Medical staff will be interviewed
 ... and a wide range of medical reference materials will be reviewed
 ... by the expert system's designer
 ... to extract their knowledge
 ... including any intuition/'rules of thumb'
 An expert systems shell may be used
 [1] for each of four points [4]
- (d)** User interface [1]
 User inputs details about the problem
 ... and receives a solution/feedback
 [1] for each of two points [3]
- Inference engine [1]
 Locates the appropriate knowledge in the knowledge base
 Infers new knowledge by applying logical processing and problem-solving strategies
 May apply fuzzy logic
 [1] for each of two points [3]

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- 2 (a)** Takes part in fact finding
 ... carried out by the systems analyst
 ... to help establish the user requirements
 Questionnaires, etc. are used
 [1] for each of three points [3]
- (b)** Acceptance Testing [1]
 To verify the system meets their requirements
 Users test the system with real data
 They provide feedback to the developer
 [1] for each of three points [4]
- (c)** 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
 For each refinement or stage, strict deadlines set/end times are set
 Requirements/functionality are prioritised/categorised
 ... as essential/non essential
 Non-essential requirements may be omitted if deadlines cannot be met
 JAD methodologies/CASE tools may be used
 [1] for each of five points [5]
- (d)** Automates or assists the management of the project [1]
 Planning/monitoring the project schedule
 Calculating and monitoring the project budget
 Creating Gantt charts/PERT chart/CPA
 Allocating resources/personnel/HW/SW
 Identifying and managing risk
 [1] for each of three points [4]
- (e)** Graphics Case tool [1]
 Automates the production of DFDs, ERM
 Automatic validation performed
 Automatically populates the data dictionary
 [1] for each of two points
- User interface generator/code generator [1]
 Produces code automatically
 ... from module specifications/IO layouts
 Code will be optimised
 [1] for each of two points [6]

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- 3 (a)** Perception [1]
 Past experiences/intuition
 ... can influence how users react to objects
 Example – the use of colours to strengthen or weaken information
 such as ‘green for go’
 The use of metaphors
 [1] for each of three 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 or icons/use of standard
 or consistent interface
 [1] for each of three points [8]
- (b) (i)** Single word commands
 ... are entered at a prompt
 Short list of commands is available
 Switches/parameters may be required
 [1] for each of four points [4]
- (ii)** It requires minimal resources, e.g. low screen resolution
 The command can be processed faster without the overheads of a
 menu/form
 Experienced users can key in a command more quickly than selecting
 from a hierarchy of menus
 [1] for each of two points [2]

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4 (a) Data independence

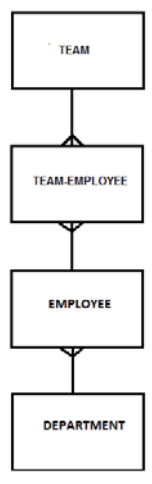
The data structure is a separate entity [1]
 ... from the software which is used to manage it [1]

Data redundancy

Attributes/fields are duplicated in the database [1]
 ... this increases the storage requirements/can lead to data inconsistency [1]

[4]

(b)



[1] for each of three relationships
 [2] for TEAM-EMPLOYEE entity
 [1] for all other entities correct

[6]

(c) 1NF

TEAM
TeamID TeamName

TEAM-EMPLOYEE-1
TeamID EmployeeID EmployeeName DeptID DeptName

2NF

TEAM
TeamID TeamName

TEAM-EMPLOYEE-2
TeamID EmployeeID

EMPLOYEE
EmployeeID EmployeeName DeptID DeptName

3NF

TEAM
TeamID TeamName

TEAM-EMPLOYEE-3
TeamID EmployeeID

EMPLOYEE
EmployeeID EmployeeName DeptID

DEPT
DeptID DeptName

[2] for 1NF, [2] for 2NF, [2] for 3NF

[6]

- 5 (a) If new system fails/produces incorrect data [1]
 ... the 'old' system is still there as a backup [1] [2]
- (b) Direct changeover [1]
 The new system is implemented
 ... and the old system discarded at the same time
 [1] for each of two points
 Pilot running [1]
 The new system is introduced in one section of the organisation
 ... and then rolled out to other parts of the organisation
 [1] for each of two points
 Phased [1]
 Some modules of the system are implemented
 When these are successful, additional modules of the system will be
 gradually implemented
 [1] for each of two points
 [3] for each of two methods [6]
- (c) A help desk
 Dedicated telephone number/link
 Speak to someone trained in using the system
 Remote diagnostics can be used to solve problem
 [1] for each of three points
User group
 This will consist of a forum of users of the information system
 ... which will communicate using emails, blogs/bulletin boards
 They will be able to find users with a similar problem
 ... or start a thread/post for a solution to their problem
 [1] for each of three points [6]
- (d) The users will be trained at multiple locations using simultaneous two-way
 video and aural transmissions [1]
Advantages
 Trainees at different locations
 ... can be trained at the same time
 ... which reduces travel costs/time away from work
 [1] for each of two points
Disadvantages
 Reliant on high-speed communication links
 ... to ensure good quality sound/video
 It can be difficult for trainees to participate fully due to its remote nature
 [1] for each of two points [5]

- 6 (a) Computer Misuse Act
 Unauthorised access to computer material is an offence
 Unauthorised access with intent to commit or facilitate commission of further offences is an offence
 Unauthorised modification of computer material is an offence
 Specific crimes and penalties are specified in this act
 [1] for each of four points
- Data Protection Act
 Controls the storage of personal data
 ... about the data subject
 Defines 8 principles
 Data users must register with the PDR
 and appoint a data controller
 [1] for each of four points [8]
- (b) Employees must comply with the Acceptable Use Policy
 One example: Usernames and passwords should be used appropriately/logging on and logging off correctly/ICT must be used for work-related purposes/appropriate use of email/portable devices
 Employees must comply with relevant legislation (CM, DP, CD&P)
 Employees are also responsible for their own safety
 ... in accordance with Health & Safety legislation
 Example: not using equipment in a reckless manner
 [1] for each of four points [4]

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7 **How ICT can be used to carry out online fraud**

Online fraud involves the unauthorised access to, and use of, the personal data which people use to shop on-line such as usernames, passwords, bank account details, family details (e.g. mother's maiden name)

Methods include:

Emails pretending to be from a bank/retailer requesting the recipient to confirm or update their account details using a disguised URL

Illegal/unscrupulous websites which obtain personal data and then misuse it or sell to third parties

Direct hacking of the retailer's database to steal personal data and then misuse it or sell to third parties

Phone calls pretending to be from a bank asking the user to confirm or update their account details by phoning a special number which the caller controls

Spyware viruses which record personal data as the user keys them in, and which then transmits this data to fraudsters who use it to impersonate the user

[2] for each of two substantive points

Measures an on-line retailer should take

Use HTTPS as this is a secure communications protocol

Use a third party (e.g. PayPal) which does not give the retailer access to customer and bank account details or vice versa

Use the secure payment methods provided by the Credit/Debit Card companies, e.g. Card Verification Code (CVC)

Proactive checking for signs of fraud – the use of different billing addresses, larger than usual orders

Educate customers that the retailer will never ask them for usernames and passwords in emails or telephone calls

Implement the latest security software and procedures to prevent unauthorised access to stored data
Whenever a customer makes a purchase, send the customer an email detailing the order which the customer must confirm

[2] for each of two substantive points

[1]/[2] for structure of report

[10]

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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]

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Total

120