AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

Mark scheme
January 2003

GCE

Information and Communication Technology

Unit ICT2

Unit 2: Information: Management and Manipulation

Overall guidelines

1. All examples accepted should be clearly related to the subject area and should not be "generalised" examples.

2. Attention should be paid to ensure that marks are not awarded for simple restating of the question or the stem, often involving the exact same terms.

3. The answers should be providing evidence of more than "man in the street's" knowledge of ICT.

4. It should be remembered that scripts could be seen after they are marked and so consistency of approach and correct mechanics of marking are essential.

5. Rules on positioning of ticks and marks are to aid in checking and remarking of scripts.

6. Do not expect the candidate to use the exact wording given in the mark scheme. If you are in doubt as to the correctness of an answer given by the candidate, consult your Team Leader.

7. Where one-word answers are acceptable this will be indicated on the question paper.

Specific marking guidelines

8. The basic rule is one mark one tick. The tick to be positioned at the point where the mark is gained in the answer and definitely not in the margin.

9. The only figures in the margin should be sub-totals for parts of questions and a final ringed total for a whole question.

10. Where questions are divided into parts *a*, *b* and so on, and a mark is indicated for each on the paper, a mark should be positioned at the end of the appropriate response in the margin.

11. There should in effect be a mark in the margin at every point there is one on the question paper and a number of ringed totals, which relates directly to the number of questions on the paper.

12. Where a question has only one part, the total for that question should be written once and then again and circled. This allows for easy checking that totalling and transcription of marks is correct.

13. All zero values should be crossed through.

14. All blank spaces should be crossed through with a vertical line through the text space – not in the margin.

15. All writing must be marked as read, either by the presence of ticks or by striking through the script with a vertical line.

16. All blank pages must be crossed through.

17. Where candidates have added extra to their answers later in the script, the total mark should be indicated as including *x* from page *y*. The total mark should be in the position where the answer starts.

18. The use of the following symbols/marks is acceptable:

    a. BOD – where the benefit of the doubt is given for the point the candidate is making. This is generally where poor writing or English is an issue. Its widespread use should be avoided.

    b. Underlining of subject specific terminology, which is misused or incorrect e.g. encoding rather than encryption, information rather than data.

    c. Underlining can also be used to highlight clearly incorrect statements or the use of a generalised phrase such as quicker, user friendly and so on.

    d. An omission mark ^ should be used where the candidate has given insufficient information to gain a mark. This is particularly useful when a teacher or student looks at scripts against a mark scheme.

    e. It may be appropriate to indicate where the same point has been covered more than once by an arrow or where a point has been covered in several lines of prose by the use of brackets.

    f. The use of letters associated with ticks **may** be used to indicate different areas being marked in a question, particularly to indicate the different bullet points in an essay. This will be outlined at standardisation.

19. **No** other symbols or comments should be used.

20. Markers are responsible for checking

    a. The transposition of marks to the front sheet

    b. That all work has been marked on each script

    c. That all marks for individual questions are totalled correctly

    d. That the script total is transferred to the box at the top right of the script.

    e. That they **clearly** initial the script, under the total at the top right, so it is possible for the Principal Examiner to identify each marker's work.

Unless indicated otherwise each bullet point is worth one mark.
/ denotes an alternative word or phrase.

1. State **three** ways of entering text into a document when using a word processor.   *3 marks*

   Topic 11.1 – Data Capture
   NB question is **STATE**

   - Keyboard/touch screen
   - Optical character recognition /OCR (NOT JUST SCANNING)
   - Voice recognition
   - Copy/cut and paste from another source/text file insertion/import

   Max 3   **3**
   (allow one word answers)

2. *What type of software would normally be used for the following tasks?*
   (a) *Creating a directory, or folder, on a computer.*   *1 mark*
   (b) *Writing a book.*   *1 mark*
   (c) *Viewing a website.*   *1 mark*
   (d) *Querying a set of records.*   *1 mark*
   (e) *Keeping financial records*   *1 mark*

   Topic 11.4 – Capabilities of software

   (a) Operating System/file management utility program (1) NOT OS

   (b) Word-processing package/DTP (1)

   (c) Browser (1)

   (d) Database management system/package /DBMS (1)

   (e) Spreadsheet/accounts package ALLOW database management system (1)

   (allow one word answers)   **5**

3. A scanner is to be purchased for use with a personal computer.
(a)   State one item of software that should be supplied with the scanner, and state why it is needed.
                                                                                            2 marks
*(b)   A map has been scanned and its image saved in a file. State **three** ways that the image of the map could*
be manipulated before it is printed.   *3 marks*

Topic 11.4 – Software; nature capabilities and limitations (a)
Topic 11.5 – Manipulation and/or processing (b)

(a)
- (Peripheral) driver (1) Provides interface/communication {including error messages} between the computer/operating system/application package and the scanner (1) / translates image into a form the computer can understand (1)
- Installation software (1) sets up communication between computer/operating system and scanner (1)
- OCR software (1) to convert paper documents to editable text (1)
- Photo editing software (1) to improve scanned images (1)
  Max 2 (0,1,2)   **2**

(b)
- Resized {accept shrunk or stretched}
- Addition of items
- Rotated (NOT FLIP, MIRROR OR ZOOM)
- Sharpened
- Edit picture
- Cropped
- Colours changed
  Max 3   **3**

4. Items stored in a computerised stock control system are identified uniquely by a product code. The
format of the product code is XX9999, where:
                        X – Capital letter (A, B or C)
                        9 – Digit
The product code has a range from AA1000 to CC9999.
*Name and describe **three** validation checks that could be used on this product code.*   *6 marks*

Topic 11.2 – Verification and validation

- Format/picture/type check (1) and description (1)
- Range check (1) and description (1)
- Uniqueness check (1) and description must include on entry of a new code (1)
- Length check (1) and description (1)
- Presence/required field check (1) and description (1)
- (File) lookup check (1) check that the code is that of an existing product (1)
- 'Duplication' check (1) warning given if same code entered twice in succession(1)

DESCRIPTIONS SHOULD APPLY TO THE PRODUCTCODE

Any 3 × (2, 1, 0)   **6**

5. The term used to describe the arrangement of computers in a network is topology.
(a) Name, and draw diagrams to illustrate, two different Local Area Network (LAN) topologies.
4 marks
*(b) State **one** different advantage for **each** topology that you have chosen.   2 marks*

Topic 11.9 – Network environments

(a)   Bus (allow line), star or ring <u>must be diagram</u> (allow other topologies if correct e.g. mesh, hybrid etc)
  • Name
  • Structure (only one mark if name contradicts structure)

2 × (2, 1, 0)   **4**

(b)   NB: **STATE**
  • Bus – cost effective in certain installations/easy to install/easy to add stations to
  • Ring – very fast transmission rates possible/fault tolerant
  • Star – speed of transmission does not degrade under load/fault tolerant/extra computers can be added without disturbing the network
  • Other – suitable ***advantage*** *must be clear*

2 × (1, 0)   2 must match (a) if not labelled use same order   **2**

6. *A company is replacing the personal computers used by its employees. The staff have been offered the choice of a desktop personal computer, or a laptop computer.*
Describe one advantage, and one disadvantage, to the staff of their choice. Your advantages and disadvantages must be different in each case:
(a) a desktop personal computer;   *4 marks*
(b) a laptop computer.   *4 marks*

Topic 11.7 – Hardware; nature capabilities and limitations

(a)   Advantage
- Larger/ clearer screen (1) better for daily use/less eyestrain (1)
- More local disk storage (1) can have several hard drives (1)
- Range of peripherals permanently available (1) greater flexibility of use/ e.g. ..... (1)
- Easier to upgrade hardware (1) e.g. fit new mother board etc (1)
- Less cramped keyboard (1) problems with RSI less likely (1)
- Other clearly identified (1), well argued points (1)
- any reverse non-duplicated points from below
- NOT COST AS ADVANTAGE IS TO STAFF NOT COMPANY
1 × (2, 1, 0)   **2**

(a)   Disadvantage
- Not mobile (1) cannot use in different place (1)
- Takes up permanent desk space (1) extra space needed for other activities (1)
- Other clearly identified (1), well argued points (1)
- any reverse non-duplicated points from below
1 × (2, 1, 0)   **2**

(b)   Advantage
- Can be used with battery power/ does not need to be plugged in (1) can be used anywhere on the move (1)
- Other clearly identified (1), well argued points (1)
- any reverse non-duplicated points from above
1 × (2, 1, 0)   **2**

(b)   Disadvantage
- easily stolen (1) small size can be carried off/ loss of data etc(1)
- easily broken/dropped (1) loss of data (1)
- Other clearly identified (1), well argued points (1)
- any reverse non-duplicated points from above
1 × (2, 1, 0)   **2**

7. Describe, with the aid of examples, three ways in which the interface between a computer and a human can be designed to provide an effective dialogue. *9 marks*

Topic 11.10 – Human/Computer Interface

- Feature (F) (1) example (E) (1) why it is effective (W) (1)

The following are only examples there could be many other responses:
- Inclusion of heading/headings (1) example (1) clear idea of process occurring (1)
- Screen design in same order as data entry form (1) example (1) allows logical procedure for user
- Sufficient space left for data entry (1) example (1) less chance of error as can be easily checked
- Navigation buttons clearly included (1) example (1) quick/easier movement between screens (1)
- Use of colour (1) example (1) clarity/ good for frequent use/good for colour-blind users etc
- On-line help (1) e.g. tool tip (1) instant aid   (1)
- Similar to other popular interface styles (1) e.g.   (1) easier to understand (1)
- Automated data entry (1) e.g. combo box (1) clear choices help to prevent errors (1)

Also any of the items below:
- windows, icons, pointers, short cuts, voice recognition, touch screens, sound, different languages etc

Any 3 × (3, 2, 1, 0)   **9**

8. An international airport is open twenty-four hours a day for every day of the year. Its computer-based flight information system is essential to the smooth running of the airport.
*Describe **four** factors that the airport must consider when designing backup and recovery procedures for this system.* *8 marks*

Topic 11.8 – Security of data

1. Testing of recovery plan (1) e.g. by testing that the backups have worked (1)
2. Training of staff to cope (1) ensuring that trained staff are always available/on call (1)
3. Recovery plan that includes both staff (1) equipment (1) location (1) data/software (1) any two
4. Frequency of backup (1) must be continuous (1)
5. Backup media/system suitable for large online system (1) e.g. mirroring/RAID (1)
6. Location (1) e.g. off-site, if on-site needs to be bomb proof! (1)
7. Availability (1) e.g. fast comms link needs to be instantly available (1)
8. Security of backup (1) security of location NOT FIRE PROOF SAFE/LOCKED DRAWER (1)
9. ALLOW consequences of failure (1) discussion relevant to flight information system (1)

4 × (2, 1, 0) NB candidates must include points 1 and/or 2 for full marks   8

9. *The human resources department in a business stores details of its staff in two flat files. One file is used to keep the staff details, and the other file is used to keep records of training undertaken by members of staff. The file structures are as shown below:*

> ***Staff file***
> *(Staff_number, Forename, Surname, Address, Home_phone_no, Start_date, Department, Extension_no)*

> ***Training File***
> *(Staff_number, Forename, Surname, Department, Training_course, Training_date)*

> *Underlined fields are key fields in each file.*

(a) *Describe, using examples from the above two files,* **two** *problems that could occur when using these file structures.*   *6 marks*

(b) *Design an efficient database structure for the above data.*   *4 marks*

Topic 11.3 – Organisation of data for effective retrieval

(a)
- Unnecessarily duplicated/repeated/redundant data (1) forename /surname/ department/ Training_date (1) repeated in both files/training records (1)
- Inconsistency of data (1) forename and surname (and department) / Training_date (1) can be different in files/training records/ files have to be updated separately (1)

Any 2 × (3, 2, 1, 0)   **6**

(b)
- Staff table/entity
- Training table/entity /Training Course Table and Staff Training table
- Removal of forename/ surname /department from Training table or Staff Training table
- Inclusion of training code
- Leaving staff number in Training table or Staff Training table
- Conversion of staff number to foreign key
- ALLOW mention of conversion to tables if specific tables not mentioned

E.g.
Staff Table
(Staff Number, Forename, Surname, Address, Home_phone_no, Start_date, Department, Extension_no)

Training Table
(Training Code, Staff Number, Training_course, Training_date)

or Training Course Table and Staff Training Table
(Training Code, Training_course, Training_date) and (Training Code, Staff Number)

Max 4   **4**