AQA

ASSESSMENT and
QUALIFICATIONS
ALLIANCE

General Certificate of Education

Computing 5511/6511

CPT2 Principles of Hardware, Software and Applications

Mark Scheme

2006 examination – June series

Mark schemes are prepared by the Principal Examiner and considered, together with the relevant questions, by a panel of subject teachers. This mark scheme includes any amendments made at the standardisation meeting attended by all examiners and is the scheme which was used by them in this examination. The standardisation meeting ensures that the mark scheme covers the candidates' responses to questions and that every examiner understands and applies it in the same correct way. As preparation for the standardisation meeting each examiner analyses a number of candidates' scripts: alternative answers not already covered by the mark scheme are discussed at the meeting and legislated for. If, after this meeting, examiners encounter unusual answers which have not been discussed at the meeting they are required to refer these to the Principal Examiner.

It must be stressed that a mark scheme is a working document, in many cases further developed and expanded on the basis of candidates' reactions to a particular paper. Assumptions about future mark schemes on the basis of one year's document should be avoided; whilst the guiding principles of assessment remain constant, details will change, depending on the content of a particular examination paper.

INSTRUCTIONS TO EXAMINERS

The following forms of notation should be used on candidates' scripts:

- Ticks - To indicate what is accepted as correct or creditworthy, placed in the body of the answer, and on diagrams;

- Underscoring – To identify errors/irrelevance in written answers;

- Crosses – to indicate a wrong answer;

- Brief comments – placed in at suitable points in the body of the text to amplify the marking;

- BOD – means benefit of the doubt and is used where the candidate's answer has been given a mark on the balance of probabilities that the candidate's answer has met the requirements of the mark scheme even though it could be interpreted differently;

- NE – means not enough and is applied to an answer that falls short of what is required;

- TV – too vague

- O/S – means outside the mark scheme. The candidate's answer is creditworthy but the answer does not match any of the answers on the mark scheme for the particular question. Nevertheless a mark is awarded;

- P1 – means penalise once. The candidates have made a common error in more than one part of the question, but is only to be penalised once for it.

- T/O – means talked out. The candidate's answer is contradictory.

The following notation is used in the mark scheme

- ; - means a single mark;
- A. - means an acceptable creditworthy answer;
- R. – means reject answer as not creditworthy.
- I – ignore
- / - means alternative word or subphrase
- // - means alternative answer

1   *benefits of <u>changing</u> OHTs to computer   n.b. transferring existing material*

easier to edit the presentation;
handouts for the audience easily produced from the slides;
presentation can be enhanced with transition effects / animation /sound / video etc;
        R *anything that could be inserted in an OHT like pictures, graphs*
presentation can be set to automated timing / next slide can be selected remotely;
presentation more widely available /can be transmitted electronically / copied via CDRom;
        A easier to make copies
quicker / easier to change slides;
reduced storage space required;
better image / projection quality – qualified (e.g. LCD projectors better than OHP);
image will not degrade over time;
1 mark per point to a maximum 3

	Total	**3**

2   *suitable secondary storage media*
(a)   DVD-R;
(b)   hard disk;
(c)   flash memory / floppy disk / DVD-RW ***A*** DVD-R

	Total	**3**

 2 correct answers (flash memory & floppy disc)   1
1 correct & 1 wrong – TO
1 not on list – I if correct. TO if wrong

3   *terminology*
(a)   a field;
(b)   a record;
(c)   a file;

	Total	**3**

4   (a)   *Copyright (not license) is*
        the (economic) <u>right</u> of the writer / <u>vendor</u> of software to <u>control</u> the use / availability
        of their material;   **1**

    (b)   *a purchaser can legally:*
        Install / Run the program on a computer;
        // Run the program on the number of computers specified in the license;
        A Make a single copy for back-up purposes
        A <u>Use it for personal use</u>   **1**

    (c)   *a purchaser cannot:*
        Make a copy (to give to a friend);
        Run it on more computers at once than you have a license for; *(accepted as different*
        from above if specified clearly)
        <u>Copy</u> and sell the software;
        Convert the program into another computer language;
        Transmit it (over a telecommunications line);
        Reverse engineer it;
        R rent it, lend it
        1 mark per point to a maximum 2   **2**

	Total	**4**

5   Validation Checks

<u>HouseID</u>	<u>PostCode / DateofBirth / HouseID</u>
Presence Check;	Format check / Picture check/ A input mask;
A value in this field is compulsory;	Field has a specific pattern of characters;
<u>HouseID</u>	<u>Date of Birth</u>
Uniqueness check;	Range check;
Ensures field is unique;	Restrict number of days /months / restrict year to appropriate;
<u>HouseID</u>	<u>NumberOfChildren / NoOfAdults</u>
Check digit check;	Range check;
Check digit recalculated on data entry;	Data must lie in a certain range;

<u>PostCode</u>
Existence check / lookup table;
Data item's value compared with a list
of acceptable values;

A presence check on any <u>one</u> field

R length check – not applicable,   combo-box (may give mark for description)

For 3 different <u>appropriate</u> checks on fields,
1 mark for name of validation check, 1 mark for description, to max: **Total   6**
Right check and wrong description TO
Right check and inadequate description – mark for check
Wrong check and right description – mark description
Description should not just repeat name of check

6   *Characteristics of real time OS*
   (a)   1 *mark per characteristic to max:*   **2**
         to support operations which are non-sequential in nature;
         to deal with a number of events which happen in parallel;
         to deal with events at unpredictable moments in time/ *concept of* monitoring &
         reacting;

   (b)   *examples of real time systems (must be appropriate to real time processing)*

         1 *mark per reasonable example of each to max:*   **2**
         e.g.:
         Extremely fast, **to:** control a nuclear reactor;
                         control a fly-by-wire aeroplane;
                         control a life support machine / car navigation system (GPS) / Engine
                         ECU / autopilot

      Not so fast, **to**: manage climate control in a(Kew Gardens) plant house / greenhouse;
                         manage Traffic lights /
            R pseudo real-time systems such as on-line transaction processing, ATMs.

                                                                    Total   4

7   *backing up policies*

   (a) *For each of i, ii and iii,*
      1 *mark for up to 2 points to max:*   **6**

> *A* IT Technician / teacher;
> overnight; backs up whole
> system; Dat tape etc; *But
> must be different from (ii)*

      (i)   students back up their own work;
          after each session; **A** every week
          on floppy disk / flash memory / DVD-RW / CD-RW/DVD-R/CD-R
          /to home computer or Internet ;

      (ii) data backed up over-night;
          automatically;
          on DAT tape, **A** DVD-R, DVD-RW, mag tape BoD **R** CD. 'tape' **NE**
          store backup in safe place;
          Use tapes in rotation;
          System administrator responsible;

      (iii) Have software on CD_Rom / DVD-R, DVD-RW;
          Keep master copy in safe place;
          Have one back-up copy;
          IT technician / head of department responsible;

   (b) *if not given in (a)*
      Backups stored away from computer/ in safe place;
      A number of tapes used in rotation /Grandfather father son system used;
      Restore operation checked;
      Make sure strategy is written down;
      Make sure staff / students are aware of the procedures which affect them;
      A one administrative consideration
      1 mark for each relevant and appropriate point to max   **2**

                                                Total   **8**

8 *e-mails*

   (a) encrypt the message: **1**
      //keep password(s) for accessing <u>account(s) / system</u> private;
      //log off from the computer at the end of the session;

   (b) 1 *mark per point to max:*   **2**
      Regulation of Investigatory Powers Act; **A** RIP Act
      (gives employers and schools) the right to <u>monitor</u> communications in the workplace;
      without the consent of the persons concerned, (for certain purposes);
      to detect criminal activity;
      R viruses, SPAM

                                                  Total   **3**

9 *PDA*

(a) Stylus **1**
& touch sensitive screen; **1**
R graphic pen, light pen

(b) *UID*
simple and easy to navigate;
ability to record number of covers ;
ability to select course / select alcoholic or non- drink;
new menu to open up for that course;
ability to scroll up / down;
ability to select / record item choice/ enter number of particular item required;
menu option to 'send' order once completed;
option to edit / change order;
option to add a note *(if explained)*;
R calculate bill
1 mark per point to max: **3**

(c) Wireless link /LAN / network /communication / technology; // Bluetooth **1**
A plug into kitchen computer / USB connection; WiFi, 802.11
Total 6
R infra-red, WAP, wirelessly
If >1 answer, mark 1st one

10 (a) *Resource management*
memory management;
resource allocation and scheduling;
file / magnetic disc / secondary store /backing store management;
peripheral device management;
interrupt handling;
A valid specific tasks
one mark per task to max: **3**

(b) *Provision of a virtual machine*
hide the complexities of the machine from the user; **1**
// provide an interface between the user and the computer;

(c) *Network OS in addition to a stand-alone computer*
control access by multiple users;
share network resources such as (shared files / applications / databases)
manage more than one user using an application concurrently ;
manage printing from more than one computer on the network;
manage security with more than one work station;
redirect request to a remote resource (e.g. shared disk);
establish / maintain communication between the work station and the server / between two workstations; **R** connections
1 mark per point to max **3**

Total 7

11 (a) *Disadvantages of system*
   Causes

   Repetitive data entry;
   Data items stored on more than one file / duplicated;
   files cannot be shared;
   No centralised, authoritative store of data;

   Effects:

   wastes time;
   increases risk of errors;
   wastes storage space;
   can cause data inconsistency;
   won't know which data is correct if two different versions;
   1 mark per cause and 1 per resultant effect to max   **4**
   Can give more than 1 effect per cause

   (b)   *sharing files*
   Data files are structured differently / have different fields;
   for different applications;
   so may not be compatible;

   //Different files may have e.g. names and addresses;
    in different formats / field lengths;   **2**

   (c) *Definitions*

   (i)   attribute – a property or characteristic of an entity;   **1**

   (ii) primary key – <u>an attribute</u> that will identify a particular instance f an entity
         A a field which identifies a record   **1**

   (iii) foreign key – an attribute in one table that is (linked) to a primary key attribute in
         anther table;
         A a field in one table which is a primary key field in a (linked) table   **1**

(d) (i) CustomerID;   **1**

(ii) OrderNumber & OrderLineNumber   **1**
A OrderNumber & PartNumber

(iii) PartNumber, OrderNumber   **1**

(iv)

Field	Surname	FirstName	DateOfOrder	Description	Quantity
Table	Customer	Customer	Order	Stock	OrderLine
Show				☑	☑
Criteria	[(Enter) Surname]	[(Enter) First Name]	[(Enter) Date of Order]		
//Criteria	Smith	Jeremiah	=23/04/06		

Mark as follows: nb Either Enter or [ ]
2nd column Customer + [Enter Surname] / Smith **1**
3rd Column Customer + [Enter First Name] /Jeremiah **1**
4th Column Order + [Enter Date of Order] or =23/04/06 **1**
// Order + = #23/04/06#
A date in other similar formats, Order + 23/04/06
5th Column Description + Stock **1**
// PartNumber + OrderLine
6th Column Quantity + OrderLine **1**
'Show' (tick, 'Yes', 'true') for Description (PartNumber) + Quantity **1**
A Show in all columns
I anything else in 'show' cells
(5th & 6th columns can be interchanged)

Total   18