AQA

ASSESSMENT and

QUALIFICATIONS

ALLIANCE

General Certificate of Education

Computing 6510

CPT1　　Computer Systems, Programming and Networking Concepts

Mark Scheme

2007 examination - January 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.

Further copies of this Mark Scheme are available to download from the AQA Website: www.aqa.org.uk

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 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;

- 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;

- C/F – means carried forward. This arises when a candidate offers an answer which is not creditworthy in one question but is creditworthy in a later question. The mark is carried forward to the question which is creditworthy;

- C/B – means carried back. This is similar to a carry forward but the mark is carried back to an earlier question.

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

- ^ - means missing term or symbol.

- F/T – means followed through. If a candidate made a mistake in the earlier part of an answer, mar the answer using the correct method on their answer from the earlier part.

The following notation is used in the mark scheme

- **; - means a single mark;**

- **A – means acceptable creditworthy answer;**

- **R – means reject answer as not creditworthy;**

- **I – means ignore.**

- **/ - means alternative word or sub-phrase;**

- **// - means alternative answer**

  <u>General Rules for Marking</u>
  Ignore Abbreviations
  Ignore Brand Names

1. (a) Hardware is the electronic / electrical / electronic circuits / /physical components/ parts of computer; **1**

    A any example e.g. motherboard
    R. 'things that can be touched'

    Software is (program) code/instructions ; **1**
    Programs that perform some task/run/using the hardware/computer;
    R. Programs (alone);
    R. applications or any example alone
    R. Programs <u>stored</u>/on the computer

  (b) (i) 3.0 GHz ; **1**

      (ii) 512 MB ; **1**

                  Total 4

2.

Software	Description (letter below)	
Income tax calculation software	G	**A**.C ;
Translator software for the C++ programming language	A/ D ;	
Word processing software	F ;	
Operating system	A ;	**4**

    R. A used for two answers

                  Total 4

3. (a) address 56 - 55 ;
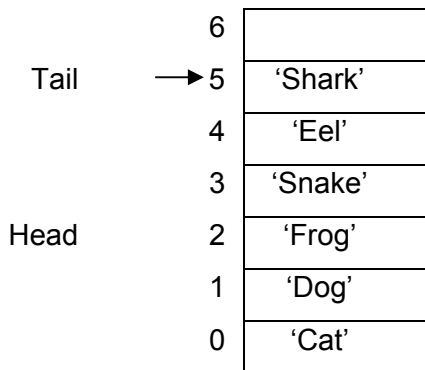address 57 – 137 ;   **2**

(b) address 56 – 37 ;
address 57 – 89 ;   **2**

(c) largest binary code used is 1001 ;
code for the first nibble is the code for '12' ;**A**. good explanation using
number >9
BCD uses codes for digits (**A**. Numbers) <u>0</u> to 9 only ;   **max 1**
                                                          Total   5

4. (a) next item to be added is at <u>position</u>/location/address (Tail + 1);
<u>Position</u>/location/address Tail is the last item in the queue ;   **max 1**
R. 'points to the end of the queue'

(b) Cat // item at position Head ;   **1**

(c)

```
          6 ┌──────────┐
            │          │
Tail  ───▶ 5 │ 'Shark'  │
            │          │
          4 │  'Eel'   │
            │          │
          3 │ 'Snake'  │
            │          │
Head      2 │  'Frog'  │
            │          │
          1 │  'Dog'   │
            │          │
          0 │  'Cat'   │
            └──────────┘
```

Snake + Eel + Shark at positions 3,4,5 ;   **1**
Tail points to 5 ;   **1**
Head points to 2 ;   **1**
I. Dog and Cat crossed through

(d) <u>Tail</u> will eventually reach position 99 (**A**. 100) ;
<u>Head</u> will eventually reach 99 (**A**. 100);
Memory/queue will become full ;
Space is not re-useable ;   **max 2**

                                                          Total   7

5 **R. '**definition type' answers which do not refer to the scenario

Data
Numbers recruited to each course / the target number of students
A. the number of students (only);

Bytes/numbers/values which make up the BMP file / spreadsheet file ;   **max 1**

R. The data/numbers on the spreadsheet
Information
The presentation of the bar chart / comparison of course numbers ;   **1**
                                                          Total   2

6 (a) *any three from*
procedures which have an interface / using parameters to pass values ;
use of modules / use of libraries ;
<u>avoid</u> global variables / <u>use</u> of local variables;
meaningful identifier/variable/constant/ procedure / function /
program/parameter names;
consistent use of case for identifiers ;
use of selection / loops / iteration ;
avoid the use of GoTo structures ;
effective use of white space / indentation;   **R.** spacing/ space out the
code
use of <u>named</u> constants ;
use of user-defined data types ;
use of pseudo-code / top down approach / Jackson methodology / process
decomposition ;

R. the use of comments/documentation
R. declaration of variables

(b) (i)

Surname	String / Text ; **A**. String[n]
NoOfYearsService	Integer /Byte / Int / Short;
PayRate	Single / Real / Float / Currency;
BasicRate	Single/Real/Float / Currency;
AdditionalRate	Single / Real / Float / Currency;

Sensible name + correct data type for single mark   **max 3**

BUT Penalise once occurrence of names containing space/other
illegal character(s) which would have scored

(ii) 3.1   If NoOfYearsService > 5 ;   **1**
            A. >= in the statement   **R.** =>
            A. mathematical notation

            NoOfYearsService := 5 ;   **1**
            A. = or := or ←

;
      3.2   PayRate := 7.88 + NoOfYearsService * 0.65
      ;   **1**
            A. £ symbol
            R. use of undefined/unassigned variable(s) in the
            calculation

      (for all three marks …) **A.** in words 'greater than', 'equals'

                                                            Total   9

7 (a) E X A M ;   *Mark as follows:*
                              1 or 2 correct   1 ;
                              3 correct   2 ;
                              4 correct   3 ;   **3**

   R. lower case

(b) (i)   Universal Serial Bus;   **1**

(ii) Parallel ;   **1**

(iii) set of rules ;
      sending <u>signals</u> between devices;
      (computer) asks are you ready? ;
      (printer) acknowledges yes I am ;
      (computer) responds here comes the data ;
      (printer) 'thank you received' ;   **max 2**

(iv) acknowledge data received by the printer ;
      error ;
      line is busy / free / ready /'status' / ACK Request ;
      timing / strobe;
      interrupt;   **max 1**
      R. Ground

(v)   operating system ;
      word processing software / text editing software / any sensible
      application ;
      print spooler ;
      <u>printer</u> driver ;   **max 2**
      R. 'printing software'

                                               Total   10

8 (a) (i) an internal web site/set of web pages // web site local to an organisation ;
(web) <u>pages</u> which can only be viewed with authority/provided with access from the organisation ;
A. provides internet facilities within the organisation
A. a LAN which uses internet protocol ;

max 1

R. Local internet
R. LAN description (alone)

(ii) <u>access to / links to</u> resources for learning / access to subject sites ;

anything related to the menu bar ;

access to resources about College facilities ;
info about / news items / read the student bulletin / exams certificates ;

links to UCAS / writing a personal statement / Student council / use the search engines / access to external web sites **max 2**

(b) (i) Hypertext transfer protocol // protocol; **1**

(ii) the pages to be accessed are on the world wide web / (the pages accessed are from) a web site ;
R. world wide web (only) **1**

(iii) the <u>domain name</u> / <u>XYZCollege.ac.uk</u> is the College's domain name ;
the domain name is registered in the United Kingdom ;   **R.** 'hosted in' ….
.ac is an academic/educational institution / .ac is the type of institution ;
A. .ac.uk is the type of site / is the top level domain
the alternative to using/the user friendly version of the IP address // has an equivalent IP address ;
what is held on a <u>Domain Name Server</u>   ; **max 2**

Total   7

9 (a) calculates the total rejects for <u>the week</u> / calculates the total of array
DailyRejects ;
outputs the total rejects for the week ;   **2**
A. Output the total only (if already mentions that calculates total rejects for the
week)

(b) (i) RejectTotal := RejectTotal + DailyRejects[DayNo] ;   **1**
A ; may be omitted
A. minor spelling errors
A. omission of the subscript

(ii) RejectTotal: Integer //
DayNo : Integer //
DailyRejects : Array[1 ..7] of integer;
I. Dim …   **max 1**

(iii) Loop counter / control the loop   / Loop control variable / inference
of a loop counter ;
Index/subscript for the array DailyRejects / reference the array
elements ;   **max 1**
R. days of the week

(iv) array of integers // array   **1**

(c) If RejectTotal > 7 ;
               Then WriteLn ('Investigate')
               Else WriteLn ('Inside weekly tolerance') ;   **2**
               A. reversed logic for both parts

(d) *Library program …*
tried and tested routines should reduce the debugging time;
development time may be reduced ; **A.** less code to write
code can be dynamically loaded only when needed ;
library files can be shared between different applications ;
A. previously written/saved program code can be reused/
A. program routines were previously saved/compiled ;
A. program code is available and used from third party providers ;   **max 2**

(e) (i)   3 / [3] / SupervisorTotal[3] := etc …..;   **1**

    (ii)

WeekNo	ThisNumber	Output	SupervisorTotal [1]	[2]	[3]
			0	0	0
1	8	Investigate	1	0	
2	9	Investigate		1	
3	1				
4	8	Investigate		2	
5 ;	9 ;	Investigate ;	;	;	1 ;

                                6
                            Total 17