ASSESSMENT and QUALIFICATIONS ALLIANCE

General Certificate of Education

Computing 6510

CPT1 Computer Systems, Programming and Networking Concepts

Mark Scheme

2007 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.

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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, mark 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 an acceptable creditworthy answer;**
- **R – means reject answer as not creditworthy.**
- **I – ignore**
- **/ - means alternative word or sub-phrase**
- **// - means alternative answer.**

General Rules for Marking
Ignore Abbreviations
Ignore Brand Names

1

(a) (sequence of) program instructions / program code / program;
Instructions processed by the processor ; MAX 1

(b)

Software category	**Example**
programming language translator	(i) compiler //interpreter//assembler ; **R.** any named language
(ii) utility // system (software) ;	Disc defragmenter
(iii) library program/files // System (software) ; **R.** library (only), library software, program libraries	A DLL file which is used by several applications programs
General purpose applications program	(iv) word processor/ database/ spreadsheet /desktop publishing **A.** web browser / presentation software ; **R.** CAD

(ii) and (iii) answers must be different 4

Total: 5

2

(a) (i) (user defined) functions // program // object // class // data type // constant // record // label //control/component/by example e.g. textbox ; MAX 2

(ii) Maximum number of characters ;
No <Space> or other punctuation characters ;
No use of reserved words ;
Must not start with a digit character ;
Case sensitive / permitted case only ;
Cannot define the same identifier name more than once ; MAX 1
R. any reference to filenames

(b) Their use matches closely the (modular/structured) design ;
Code can be used 'repeatedly' within the same program ;
Code may originate from a program library/module ;
To make program debugging/testing/maintenance easier ; MAX 1

(c) (i) 10 ; 1

(ii) -1 ; 1

Total: 6

3

(a) (i) computers/devices/nodes/PCs connected/linked/communicate together ;
R. machine
A. using a LAN protocol e.g. Ethernet
over a small geographical area / e.g. a room/a building /a site ; 2

(ii) bus ; **R.** line 1

(iii) serial ; 1

(iv) ring // star ; 1

(v) printer; (bar code) scanner; multifunction machine ; modem ; message boards ; server providing audio/video or any additional server; console dedicated to audio/video ; projector ; FAX machine ; external hard drive ; card reader ;
A. bridge / hub, / switch / router / gateway / firewall ; MAX 2

(b) (i) bargainbooks-r-us.co.uk ; 1
R. answer with anything added to this

(ii) The file (name); the page requested; home page; MAX 1

(iii) the web server cannot find the page requested //
(examples) the page has been deleted / moved to different folder / does not exist ;
the page is in the process of being updated / page is currently off-line;
R. anything which implies there is no connection
R. timed out

(c) (i) computers (and networks) connected/linked/communicating ;
A. using a WAN protocol e.g. TCP/IP
over a large/wide geographical area / e.g. city/county/country/ globally / e.g. The Internet ;
R. WWW 2

1

(ii) e-mail communication with the outside world (A or B) ;
email/easier communication between libraries // the library and a borrower (A or B) ;
enquiries about books available at other libraries (A or B) ;
electronic transfer of documents/information between libraries (A only) ;
backup of data/network administration for all libraries is more manageable/done centrally (A only) ;
A. Accept benefits which imply access to the World Wide Web / Internet (A or B) ; MAX 2

Total: 14

4

(a) (i) String / Text / Char ;
R. alpha / alpha-numeric / character 1

(ii) Integer / Date (and Time) ; **A.** String 1

(iii) Boolean ; **R.** Yes/No 1

(b) (i) Book ; 1

(ii) False / F / No // f/t from the (a) (iii) answer e.g. stated as integer - value 0/1 1

(iii) True / T / Yes // f/t from the (a) (iii) answer e.g. stated as integer - value 1/0
(MAX 1 for (ii) and (iii) if no indication of meaning when integer used) 1

(c) (i) T76542 ; 1 ; 2

(ii) T ;
I. the quote marks (i) and (ii) 1

(iii)

NextAvailableCode	Book	LocationLetter
1	1	'T'
2	2	'T'
3	3	(gap not required)
4	4	'M'
(in sequence – possible repeat of 3 and/or 4	5	Penalty -1 if the first 'M' is followed by either 'T' or 'X'
	6	

Figure 4

	Location
[1]	'Torrington'
[2]	'Torrington'
[3]	
[4]	'Morristown'
[5]	

Figure 5

	NewCode
[1]	1
[2]	2
[3]	
[4]	3
[5]	

Figure 6

Total: 15

5

(a) Last (item) in, is the first (item) out / first (item) in is the last (item) out ; 1
R. LIFO / FILO

(b) (i)

600	‘A’
601	‘V’
602	‘E’
603	‘R’
604	‘Y’ ;
605	

All items in the correct locations 1

(ii)

599	
600	‘A’
601	‘V’
602	‘E’ ;
603	
604	
605	

Correct three items // ft from an incorrect (i) including 605 as the first location used ; 1
A. ‘R’ and ‘Y’ entries indicated in some way as ’deleted’ 1

(iii)

600	‘A’
601	‘V’
602	‘E’
603	‘S’
604	‘P’ ;
605	

Correct list of five items // ft from an incorrect (i) + a correct ft (ii) including 605 as the first location used ;

(c) (i) Queue ; **A.** First In – First Out FIFO / LILO 1

(ii) <u>Items</u> are removed/popped from the stack (one at a time) (and items are then added to the queue);1

(iii) Items leave the queue on a ‘first in-first out’ basis ; **A**. from the front of the queue 1

(iv) ‘Y’, ‘R’, ‘E’, ‘V’, ‘A’ on the queue ;
‘Y’, ‘R’, ‘E’, ‘V’, ‘A’ on the final stack ;

A. using 701 for the first queue location 2

Total: 9

6

(a) 255 / 11111111 / FF / 2^8 – 1 ; 1

(b) (i) 81 ; 1

(ii) 1000 1010 ; 1

(c) 522 1

(d) (i) 100 0010 ; 1
R. leading 0 as 8th bit

(ii) the total is calculated before transmission ;
0 or 1 bit is added (to the 7-bit code) ;
So that, the total number of 1 bits must compute to an even number ;
the number of one bits is re-calculated after received ;
an odd number of 1 bits indicates an error ; MAX 2

Total: 7

7

(a) (i) 1 GB ; 1

(ii) 300 GB ; 1

(b) control (bus) ; 1

(c) data bus has to transport data values to and from various devices/internal components ;
Only the processor assigns address values to the different devices ; MAX 2

(d) logical // read // write // jump/branch // input // output // data transfer ; 1
A. Boolean

(e) program instructions are transferred from backing store to main memory ;
program consists of a sequence of instructions ;
program is stored in main memory ;
and can be replaced by another program at any time ;
instructions are fetched (in sequence) ;
decoded ;
and then executed ; MAX 3

Total: 9