UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS

GCE Advanced Subsidiary Level and GCE Advanced Level

MARK SCHEME for the October/November 2011 question paper for the guidance of teachers

9691 COMPUTING

9691/11 Paper 1 (Written Paper), maximum raw mark 75

This mark scheme is published as an aid to teachers and candidates, to indicate the requirements of the examination. It shows the basis on which Examiners were instructed to award marks. It does not indicate the details of the discussions that took place at an Examiners' meeting before marking began, which would have considered the acceptability of alternative answers.

Mark schemes must be read in conjunction with the question papers and the report on the examination.

- Cambridge will not enter into discussions or correspondence in connection with these mark schemes.

Cambridge is publishing the mark schemes for the October/November 2011 question papers for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level syllabuses and some Ordinary Level syllabuses.

1 **(a)** – To hold data when computer is switched off
– To be able to reload data at a later time/for future use
– To store extra copies in case of corruption of original
– Archiving of data
(1 per –, max 2) [2]

(b) – Portable hard drive/to store OS/Software/Files
– Flash/Pen/Solid state pen drive/to transport files between home and school/backup/ archive
– CD/DVDRW drive/to store back ups/archive
– floppy disk drive
(2 per –, max 2 –, max 4. Allow other examples with purpose) [4]

(c) **(i)** – Only one user can use it at any one time
– Recognises user and user rights
– Able to give impression that more than one thing can be done at a time
– keeps an individual's files more secure
– more than 1 application open at the same time [not in (i) and (ii)]

(ii) e.g. – Typically allows word processor to be used while monitoring the Internet for email traffic.
(1 per –, max 4) [4]

2 **(a)** – Diagrams used to plan new solution/DFDs/Algorithms
– Designs of Input and Output screens / user interface...
– probably as prototypes with nothing behind them
– discussion between analyst + client/user
– hardware/software requirement considered
– Data structures will be designed
– Processing requirements will be decided
– Objectives agreed with client
– Design test strategy
(1 per –, max 4) [4]

(b) – Purchase and installation of hardware
– Installation of software on the hardware
– Creation of data files
– Producing user manuals
– Consideration of need for training staff
– Method of changeover decided
– convert/transfer files
– Consideration of future maintenance of system
– Uninstalling the old system
– Monitoring initial performance of system
(1 per –, max 4) [4]

3
– Limit volume of information because...
– small screen and...
– important to remove extraneous information...
– because driver can only glance at screen
– appropriate colour used to show route on map
– Sound to provide a commentary of directions...
– so that driver does not need to look away from road
– buttons/ touch screen bfor input / menubased …

(1 per –, max 5) [5]

4 Set-up
– Data collected from experts in the field...
– and from resource material like books/encyclopaedias/...
– create user interface
– Data stored in the knowledge base
– create inference engine
– Rules governing the use of the data are stored in the rules base
– test the system against known outcomes max 4

Use
– Questions asked about the sample as part of the interface
– Knowledge base is searched for answers to questions posed
– inference engine used…
– Results are presented on screen/given to user along with...
– Probabilities in percentage form
– Reasoning behind the results given / explanation system max 4

To a max of 6 [6]

5 **(a)** **(i)**
– Set of data items of the same type
– Stored together, physically
– Under a common name...
– using index as reference
– One dimensional array is a list

(1 per –, max 2) [2]

(ii)
```
INPUT ITEM
FOR I = 0 TO END_OF_ARRAY
    IF ARRAY (I) = ITEM THEN 'FOUND', END
NEXT I
REPORT 'NOT FOUND'
```

Mark points:
– Identify item to be found
– Loop with suitable condition
– Condition statement correctly structured with suitable condition
– Error condition reported

(1 per –, max 4, accept any form of presentation of mark points) [4]

(b) – dimension an array
– Two pointers.../one pointer
– One to front, one to rear / to front
– Data input is stored at rear pointer and pointer moved / move down queue to last ite and link new
– Data read from queue is read at front pointer and pointer moved
– Check made for queue full/empty
– is a FIFO structure
– Example of a FIFO structure
(1 per –, max 4, accept all points shown on diagrams) [4]

6 **(i)** – Temperature sensor/keypad/remote control
– To give processor information about temperature in room/required temperature and when to operate/Time [2]

(ii) – Actuator/Screen
– …To allow processor to control air conditioner/to tell user the parameters
– speaker/beeper
– …to confirm / reject inputs
– LED
– …To show system is working / show if temperature is OK [2]

7 **(a)** **(i)** – prompts question to ask
– Ensures all details are taken
– Allows for ease of validation routines/standard entry of data/reduces entry error
– All data is relevant
– Allows use of drop down lists and radio buttons
(1 per –, max 3) [3]

(ii) – Necessary to read all records in sequence...
– to update file and to ensure all statements are produced
– Need fast access to data to answer individual queries
– The indexing allows for fast access.
(1 per –, max 3) [3]

(b) **(i)** – Necessary because if original date is corrupted/lost, back-up can be used to replace it [1]

(ii) – File copied daily...
– to portable storage...
– at least one copy kept off site / in fireproof safe
– Mention of need for Transaction Log
– test restore process
(1 per –, max 3) [3]

8 **(a)** Hardware: 2 from: Router/Gateway/Modem/cables
Software: Browser/Communications software/modem driver/firewall [3]

(b) – Video files contain large volumes of data
– If watched at a later time then it does not matter how long download takes...
– therefore bit rate can afford to be low
– if watched as it is downloaded then the bit rate must be high...
– or the video will not run without jerking/losing quality
(1 per –, max 4) [4]

(c) **(i)** – Handshake ensures that both parties are ready to communicate
– Must agree on the format of the medium for communication e.g. serial
– Must agree error checking e.g. parity
– Must agree form of data to be used e.g. character set
– specify parameters (if not one of 3 above)
(1 per –, max 3) [3]

(ii) – To allow manufacturers to create for one layer/to allow different devices to communicate effectively
– different layers deal with different part of communication
– To allow a layer to be altered...
– without the need to alter other layers...
– only the links between the layers need alteration max [2]

(d) **(i)** Software ready for immediate use / readily available [1]

(ii) – Development costs are shared
– Commonly used, therefore trained workforce
– Plenty of help available if you get stuck / help books available
– better tested
– Parts of software compatible with others in suite
– Regularly upgraded
(1 per –, max 3) [3]

9 **(a)**

A	B	C	D
0	0	0	1
0	1	1	0
1	0	1	0
1	1	1	0

(1 for each of the two columns C and D) [2]

(b)

A	B	E	F
0	0	1	0
0	1	0	0
1	0	0	1
1	1	0	0

(1 per pair, max 4) [4]