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

9691/13 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) (i) To pass data to a computer/for processing

(ii) To give information from the computer/after processing

(b) – Screen/to show the price of the current item/to show amount owed
     – Printer/to print receipt for customer
     – Buzzer/to indicate when the barcode has been correctly read
     (2 per –, max 2–, max 4.)   [4]

(c) – Data are collected to be input to the system together
     – processing a set of similar items
     – This happens at a quiet time (at night when the supermarket closes)
     – Does not require human interaction (workers have all gone home)
     – Requires a JCL to control the process
     – Results are not time sensitive
     (1 per –, max 4)   [4]

2 (a) (i) Questionnaires
     – Advantage: Can collect the views of many people very quickly/can keep the replies restricted/on-message
     – can analyse the results more easily
     – Disadvantage: Cannot change lines of questions because of interesting responses/Responses may not be truthful/Workers may not bother to respond/hard to be comprehensive   [2]

(ii) Interviews:
     – Advantage: Can change line of questioning according to responses/Allows greater freedom of response to interviewee
     – Disadvantage: Takes a lot of time/Freedom of response may mean that interviewee does not stick to the point/Must be carried out when both interviewer and interviewee are free   [2]

(b) (i) – Parallel where the old and the new run together for a period
     – to ensure the new system give same results as the old
     – until the new system is proved to be reliable/allows for training of staff
     – increases the costs of implementation
     – if new system fails you can go back to the old one   [2]

(ii) – Pilot where system is introduced to one small section of organisation
     – If system fails then remainder of organisation can absorb failure on the old system/staff can be fully trained before system is fully implemented
     – critical/ non-critical section first + reason   [2]

3 – Colour used to show different types of information on screens
  – different windows keeping data areas separate
  – Some colours/reverse video/flashing reserved for important messages
  – Sound to provide an alarm if something is wrong
  – failsafe "are you sure" response to dangerous input
  – so that attention of operators is immediately drawn to that information
  – Content will remain constant for many outputs…
  – retrieve history of past actions
  – Peripherals for input, probably touch screen to isolate area for inspection…
  – keyboards for changing parameters of processing
  (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) FOR I = 0 TO END_OF_ARRAY
      ARRAY (I) = 0
    NEXT I
    Mark points:
  – Use of appropriate loop structure
  – Correct condition on loop
  – Correctly set successive values to 0 [3]

(b) (i) – dimension an array
    – Data input to the stack is placed at pointer/on top
    – Pointer reset to top of stack/incremented
    – Data read from stack is read from top of stack
    – Pointer is decremented
    – Check always made for stack full/empty
    – stack is LIFO structure
    – Example of a LIFO structure
    (1 per –, max 4) [4]

    (ii) IF POINTER +1 > SIZE OF THE ARRAY
              THEN REPORT STACK FULL
              ELSE CONTINUE WITH OPERATION
        ENDIF
        Mark points:
        –   Condition statement…
        –   with correct condition (accept pointer > size)
        –   Two alternatives in correct order
        (1 per –, max 3)   [3]

6 –   CD/DVD ROM/blueray/HDD
       –   holds software/pre-recorded music/films
       –   To listen to pre-recorded music/to buy software
    –   CD/DVD RW
       –   To make backup copies of files/to make copies of files to take into school
    –   CD/DVD R
       –   To make copies of films/albums/archive… which will not be altered
    –   DVD RAM
       –   record and playback simultaneously
    (1 per –, max 2 pairs, max 4)   [4]

7 **(a)** **(i)** –   Simple/easy to use, users may be computer illiterate
                 –   Helps the user to get to information that they may not have been aware of
                 –   Structure of the information system will not change very often/menus will remain unchanged
                 –   Limits access by user to specific parts of system
                 –   Fits use of an indexed sequential filing system
                 –   Does not require any input from user except for choices from screen/allows for obvious use of touch screen

          (ii) –   Indexes match structure of menu screens
                 –   Level of index match level of menu screen
                 –   Structure will change rarely
                 –   Data can change on a regular basis
                 (1 per –, max 4 per dotty, max 6)   [6]

    (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) (i) Hardware: 2 from: Network cards/cable/wireless NC/server/terminators/bridge

     (ii) 1 from: Router/Gateway/Modem/Communication medium/firewall

  (b) – One bit in byte reserved as parity bit
     – this is set to 0 or 1 before transmission/storage
     – to make the sum of all the bits in the byte even (or odd)
     – e.g.01101100 is acceptable whereas 01101101 is not (in even parity)
     – Check is repeated when the byte is received to ensure even (odd) number of bits set to 1
     – Mention of parity block for automatic correcting
    (1 per –, max 4)   [4]

  (c) (i) – Off the shelf software will not exist…
        – because the application is very specialised
        – so it (software) will do exactly what they want …
        – so it does not contain unnecessary features
       (1 per –, max 2)   [2]

    (ii) – This is an analogue measurement…
        – and hence impossible to get exact
        – Adjustments to the rollers cannot be precise enough to get exactly 5mm
        – The computer would constantly be adjusting the rollers together/apart/together/…
        – The plastic sheeting does not need to be any more accurately produced than to the nearest 1mm
        – rollers might become worn
       (1 per –, max 2)   [2]

    (iii) – Sensors used to measure thickness of sheet/distance apart of rollers
        – use of ADC
        – This data sent to the computer
        – Computer decides whether thickness is within tolerance
        – If outside tolerance then message sent to actuators…
        – to move rollers further apart if the sheet is too thin
        – to move rollers together if the sheet is too thick
        – Unit of movement of roller (possibly .02mm)
        – Delay before next reading taken from sensors to allow previous decision to take effect
        – Set alarm if decision not having desired effect
       (1 per -, max 5)   [5]

9 (a)

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

(1 for C and 1 for D)   [2]

(b)

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

(1 per pair, max 4)   [4]