UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS
General Certificate of Education
Advanced Subsidiary Level and Advanced Level

COMPUTING **9691/01**

Paper 1 Written **For Examination from 2011**

SPECIMEN MARK SCHEME

1 hour 30 minutes

MAXIMUM MARK: 75

This document consists of **5** printed pages and **1** blank page.

UNIVERSITY of CAMBRIDGE International Examinations

[Turn over

1 **(a)** **(i)** -Controls responses to external requests/controls hardware/makes system work/acts as an interface between the user and the hardware/controls input and output [1]

(ii) -Program that allows the user to do something useful/something that would have needed to be done without the computer [1]

(b) -Batch not time sensitive
-Real-time must produce some sort of immediate output [2]

(c) -e.g. payroll
-because data must be collected before the appropriate processing is carried out [2]

2 **(a)** **(i)** Communication is only one way [1]

(ii) Communication is two way and may be at the same time [1]

(iii) Communication is two way but only one way at a time [1]

(b) **(i)** -Processor transfers data from primary memory to fill buffer
-Data sent from buffer to secondary storage while…
-processor continues with other tasks
-When buffer empty, interrupt sent to processor
-Processor may interrupt current job
-Deals with request to fill buffer
-Mark for mention of importance of priority of interrupt
(1 per -, max 5) [5]

(ii) -Half-duplex
-because the system may be set to transfer data and then stop when a set number of packets are transferred in which case the replying interrupt is only sent when data is not being transferred
(2 possible mark points) [2]

3 **(a)** -Is the solution technically possible?
-If the hardware or software does not exist then the solution cannot be implemented
-Is the solution economic to produce?
-If the cost of the new system will not reasonably be recoverable then it is not sensible to produce it
-Is the solution economic to run?
-If the running costs will not be smaller than at present then cost is not a reason for change
-Effect on the work force
-If the human cost (e.g. mass redundancy) is great then there may be unacceptable social costs
-Is the work force skilled enough?
-If there are no skilled workers to work the new system then it is not worth producing
-Will customers notice a difference?
-If there is no improvement in price/quality/reliability of the product then is the extra expense worthwhile?
-How long will the introduction of new system take?
-If it is too long then any beneficial effects may have been lost

-What are the legal implications?
-e.g. if the DPA says that it is not legal to use the data in this way then the proposed system cannot be used
(2 per pair, max 3 pairs, max 6) [6]

(b) -Interviews…
- to allow important members of staff to make their own points
-Questionnaires…
-so that all members of staff can feel that their view is important
-Document collection…
-to ensure that current data required is covered on the new system
-Observation…
-to see how the processes are carried out and what the processes are
(1 per -, max 5) [5]

4 **(a)** Custom:
-A package especially written to solve a specific problem
-Contains all the features that the business needs…
-including non standard ones
-Does not contain features that will not be used

Off-the-shelf:
-Pre-written (generic) software
-Immediately available
-Shared development costs makes the software cheaper to buy
-Ready pool of trained workers
-Software will be fully tested
-Compatible with other organisations
-Readily available help groups
(1 per -, max 3 points from either type, max 5) [5]

(b) -Word processor
-to process reports/write letters to customers
-Spreadsheet/Accounting software
-to store accounts/produce itemised invoices for customers
-Database
-to manipulate customer/stock files
-CAD
-to design new buildings/extensions/interiors…
-Graphical/presentation
-to produce advertising material/marketing presentations
(1 per -, max 3 pairs of points, max 6) [6]

(c) **(i)** -Contrasting colours for background and text or text becomes difficult to read
-Colour (red) to highlight items more important than others, needs to be used sparingly
-Use of corporate colour scheme
-Care with red/green because of colour blindness

(ii) -Layout should follow normal reading pattern for eye because less chance of errors or omitting detail
-Limit the volume of information because otherwise too daunting

-Ensure that all areas of screen are used and that density of information is not dependent on position
-Layout should be similar on different types of software so that user gets used to it

(iii) -Content should be similar across pieces of software to enable user to be trained easily
-Content must be relevant or user will begin to ignore it
-Content type must be accurate (if in red it really must be urgent)
-Help should be available

(1 per -, max 9) [9]

5 -Barcode consists of pairs of dark lines
-of varying thickness
-which combine to give a (character) code
-Used to identify worker
-OCR is a means of computer reading standard characters
-comparing the values with examples in memory
-Light reflected off character
-determines shape by reading intensity reflected in small squares
-fewer characters the better
-Used for reading times/signatures…
-Different days signified by different positions of data on the card
(1 per -, max 3 for each, max 6) [6]

6 **(a)** -Size of array calculated
-Location of array decided…
-according to data type/size
-Locations reserved
-Array named in look up table
-Size of array stored in table
-Lower/Upper bound of array stored in table
-Data type stored in table
-Address of first element stored in table
(1 per -, max 4) [4]

(b) -Index set to 0 (or other sensible value)
-Array(index) searched
-IF = Item then “Found”
-ELSE increment Index and repeat line 2
-Until found or produce “Error Report”
(1 per -, max 4) [4]

7 **(a)**

A	B	Output
0	0	0
0	1	1
1	0	1
1	1	1

(-1 for each error in the output column) [2]

(b) **(i)**

A	B	C	S
0	0	0	0
0	1	0	1
1	0	0	1
1	1	1	0

(1 per row) [4]

(ii) -Adds together two single bits
-Part of an accumulator/half adder [2]

8 **(a)** -A set of rules/instructions
-to allow communication between devices [2]

(b) **(i)** -Circuit switching involves setting up the route for the message before any of it is sent
-Packet involves sending the message in segments of equal size, each of which finds a different route to the destination [2]

(ii) -Circuit means that the message does not have to be reordered at the destination
-Packet means that the message is almost impossible to intercept/large amounts of the communication medium are not idle for other messages until the given message is completed [2]

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