

MARK SCHEME for the October/November 2012 series

9691 COMPUTING

9691/13

Paper 13 (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 should be read in conjunction with the question paper and the Principal Examiner Report for Teachers.

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Cambridge is publishing the mark schemes for the October/November 2012 series for most IGCSE, GCE Advanced Level and Advanced Subsidiary Level components and some Ordinary Level components.

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	GCE AS/A LEVEL – October/November 2012	9691

- 1**
- (a)**
 - (i)** – the physical parts of a computer system
 - (ii)** – a peripheral device...
 - which translates signals from the computer into human readable form
 - presents the results of processing the data to the user
 - allow examples of devices
 - (b)**
 - (i)** – to type/enter text
 - to be able to edit/change the report
 - (ii)** – to show projected sales
 - produce graphs/calculations
 - (iii)** – to send the report electronically as an email attachment
 - (c)** – barcodes consist of a series of black-white lines of varying thicknesses
 - lines are taken in pairs along with the gaps between them
 - the different thicknesses create a pattern which can be interpreted as a code
 - mention of EAN or UPC
 - read by a laser at the checkout...
 - which shines a laser beam at the barcode and the reflected laser light is detected
 - the barcode can be read in either direction
 - the level of reflected light is converted to a digital reading
 - the code is then compared with the codes stored on the product file in the computer system...
 - and the required details (e.g. price) are returned to the checkout
 - mention of code being checked before use and buzzer sounding if read properly
 - mention of stock control

(1 per –, max 6)
- 2**
- knowledge base
 - to store all the data/facts about the application
 - inference engine
 - to apply the rules in the rule base to the data in the knowledge base
 - rule base
 - contains all the rules applied to data in the knowledge base
 - contains all the rules the inference engine uses
- 3**
- (i)** – any application where images used (e.g. social networking site)
 - to show images of the owner of the page and their friends
 - (ii)** – any application which is interactive (e.g. tourist information board)
 - to allow the user to ask for information and to allow the answers to be displayed
- 4**
- (i)** – software that is supplied with a piece of peripheral hardware
 - allows communication between the hardware and the operating system
 - converts commands from one into instructions that the other can carry out
 - allows devices to communicate with the computer

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- (ii) – software which erases the contents of the whole disk
 - tracks and sectors checked to ensure correct format/id bad sectors
 - initialise FAT/NTFS
 - prepares new disk for use
 - disk surface divided into tracks and sectors
- [3]

- 5 – is the technology available to solve the problem/is there a robot that can manipulate the parts satisfactorily
- is it economically possible to produce the solution/will the production line operate as cheaply as it does at the moment
 - can it be produced in a reasonable time frame
 - will the end product be so expensive that it bankrupts the company
 - are the social effects likely to be too damaging/will the Government allow the company to replace so many jobs with machines
 - will computerisation of the problem put too many people out of work
 - are there enough skilled people available to make the solution operate effectively
 - is the solution legal
- (1 per –, max 5)
- [5]

- 6 (a) – stores the data to be used in the processes
- stores the part of the program currently in use
 - stores the part of the operating system currently in use
 - stores the results of processing generated by the processor
- (1 per – max 3)
- [3]

(b) (i) a temporary store/area

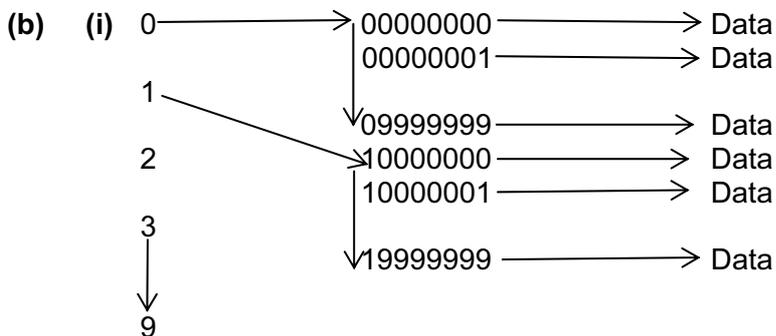
[1]

(ii) a signal sent to the processor

[1]

- (c) – data sent to a buffer from the memory
- processor can continue with other tasks while...
 - buffer is emptied to the disk drive
 - when the buffer is empty an interrupt is sent to the processor...
 - from the disk drive...
 - for more data to be sent
 - the contents of the registers are stored and the buffer is refilled
 - credit the concept of interrupt priority and need to queue with other current interrupts
- (1 per –, max 4)
- [4]

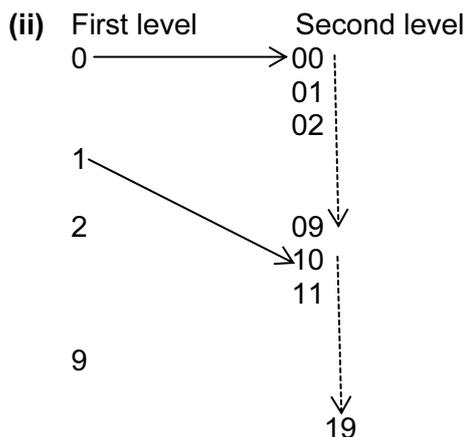
- 7 (a) – records held in logical order...
 – according to bar code/key field



Mark points:

- digits 0 to 9 shown...
 - as index
 - each leading to a sequence of bar codes
 - each barcode pointing to a record
 - indication that not all possible bar codes will be represented
- (1 per –, max 3)

[3]



Mark points:

- for correct first level pointing to...
 - correct second levels
 - correctly identified options of 0-9 at each level
- (1 per –, max 2)

[2]

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- 8 (a) (i)** – e.g. mouse/touch screen/trackerball
– to select flights
- (ii)** – e.g. speakers/screen
– position of aeroplanes shown (as moving graphics)
– can give out danger warnings if flight paths too close, for example [2]
- (b) (i) Content:**
– flight number shown for each plane
– use of sensible icons
– limited amount of information on each screen
– only current/relevant information should be shown
– content should be animated to show movement of planes in real time
– should be a separate screen/sound to show any problems that the system might identify
– use of sensible icons
– information about flights e.g. flight number/destination/height/speed
- (ii) Layout:**
– layout should be the same for each plane
– position of plane on screen relates to real plane in the airspace...
– hence giving extra information without needing to state it
– screen should be like a map of the airspace controlled
(1 per –, max 3 per group, max 5) [5]
- 9 (a) (i)** – transmission is sent in both directions at the same time...
– along a single data line/one bit at a time [2]
- (ii)** – transmission can be in both directions but not at the same time...
– along several data lines/one data line per bit/one byte at a time [2]
- (b)** – a set of rules/standard instructions
– to govern the transmission (or exchange) of data/communications [2]
- (c)** – bytes are arranged in blocks
– the value of bytes in each block found
– checksum is transmitted with the data
– the calculation is repeated at the destination
– any difference signifies an error has occurred
(1 per –, max 4) [4]

10 (a) (i) A B C D
0 0 0 1
0 1 0 1
1 0 0 1
1 1 1 0 [1]

(ii) NAND gate [1]

(b)

A	B	C	D	E	F
0	0	0	1	1	1
0	0	1	1	1	1
0	1	0	0	1	0
0	1	1	0	0	0
1	0	0	0	1	0
1	0	1	0	1	0
1	1	0	0	1	0
1	1	1	0	0	0

(1 mark for each bold box)

[4]