

**MARK SCHEME for the May/June 2012 question paper
for the guidance of teachers**

9691 COMPUTING

9691/13

Paper 1 (Written Paper), maximum raw mark 75

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- 1 (a) (i) - ROM is non volatile/RAM is volatile
 - Data held on ROM cannot be altered/Data held on RAM can be altered
 (1 per -, max 2) [2]
- (ii) - It is necessary to be able to alter them/faster access to the data [1]
- (iii) - Parts of operating system in use
 - Parts of applications software currently in use [2]
- (b) - Purpose is to store files/software/O.S....
 - To store files/software/O.S. because RAM is too small to do so
 - ...when the computer is switched off because there is nowhere else to store them/RAM is volatile
 - ...to act as a back-up of files in case the main copy in use is corrupted
 - if portable device, allow files to be transferred to another computer
 (1 per -, max 2) [2]
- (c) Input - Sensor of suitable type (Touch/pressure/radar/...)
 - so that the computer can know when an object is blocking the robot's path
 - Keypad/Touch Screen
 - to allow instructions to be given to the robot
- Output: - Actuator
 - to control the motors driving the wheels
 - LED screen
 - to show program choices made
 - Buzzer/beeper/speaker
 - to allow warning if error/battery power low/dust bag full
- Storage:- ROM/solid state storage
 - to store the control program for the robot
 (1 per -, max 3 pairs, max 6) [6]

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- 2 (a) (i) The systems software which controls the operation of the computer. [1]
- (ii) Software to carry out a task which would need to be done if a computer was not available. [1]
- (b) (i) - Custom-written is software which is written in response to a user's specific requirements.
- Off-the-shelf software is written to respond to the requirements of a group of problems that are similar/is available to buy in a shop. [2]
- (ii) Advantages
- Individually produced and specific to requirements
- No unused facilities wasted
Disadvantages
- Will be a lengthy process to produce it/not immediately available
- high cost because have to pay for whole development cost
- Workforce will need training to use it because they will not have used it before
(1 per -, max 4) [4]
- (c) (i) To give customers visual representation of what their kitchen will look like with the new appliances [1]
- (ii) To store details of potential customers who arrange a visit / taking orders [1]
- (iii) To produce an audio visual presentation to attract people in the mall [1]
- (d) - Many users can use the same computer simultaneously...
- ...while believing they are the only user
- Each user is given a slice of computer time in turn...
- before going on to the next
- Will eventually get back to first on a round robin basis
- This is repeated so quickly that there is no discernible delay for the user
- Use of flags to indicate if processor time is required
- Some terminals may be of a higher priority and hence have more time.
- users need login name and password
- each user's "work" is stored in different parts of computer memory
(1 per -, max 4) [4]

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- 3 (i) One where the required data is collected together before processing/processed all in one go [1]
- (ii) - e.g. Payroll production/utility billing/cheque clearing at banks
- (iii) - The pay of a worker cannot be calculated until all the data about work done is collected
- The pay is calculated at the end of the week/all the calculations are similar/large amounts of data [3]
- 4 (i) - Barcode is a series of dark and light lines of varying widths
- The widths are measured by shining a laser light onto the lines
- Pairs of lines stand for digits in the barcode
- e.g. Checkout till in a supermarket
(1 per -, max 2 of first 3 points + last point, max 3) [3]
- (ii) - Three strips of information available on each card/small amount of data is stored
- The stripe is read by swiping the stripe through a card reading machine
- e.g. Paying for goods by credit card
(1 per -, max 2 of first 3 points + last point, max 3) [3]
- 5 - Corrective maintenance
- To solve any problems/bugs that may arise with the software
- Adaptive maintenance
- To alter the solution in order to take account of external influences e.g. the factory wins an order requiring SI units as opposed to metric ones
- Perfective maintenance
- To alter the solution to improve performance
(1 per -, max 5) [5]
- 6 - The interface will need to hold the attention of the child...
- ...use of colour will be important/..use of animation/..use of cartoon characters/...large size for any numbers displayed
- Sound must be used to encourage children...
- ...e.g. perhaps a fanfare for a right answer
- Must consider special needs of children:
- ...e.g. are they colour blind/are they disabled...?
- Consideration must be given to the way the child interacts with the interface...
- ...use of touch screen/use of speech into microphone...
- Appropriate level of language used/level of difficulty
- Appropriate use of feedback
- Relevant/limited content only shown
(1 per -, max 6) [6]

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- 7 (a) (i) 00110 11110 [1]
(ii) 108 [1]

- (b) (i) e.g. 'S'/'S'/'S'/'5" [1]
e.g. 01012012 / 20120101 [1]

(ii)

Field name	Data type	Reason
SupplierName	String/Text	Non-numeric characters
MinimumStockLevel	Integer/int/Short/Byte	Must be a whole number and will be small in size
Price	Decimal/Single/Float/Currency/Real	Must allow currency to two decimal places

If wrong data type do NOT allow reason

[6]

- 8 (a) (i) - Computers are geographically remote
- Communication links are typically provided by a third party/telephone link
- Will allow communication between the different LANs.
(1 per -, max 2) [2]

- (ii) - Single bits are transmitted in sequence
- ...down a single wire [2]

- (b) (i) - Type of parity (odd or even) is agreed by both devices concerned with the communication
- Transmitting device counts number of 1 bits in the byte
- One bit is reserved for parity bit
- This parity bit is set to 1 or 0 in order to make the number of 1s in the byte an odd or even number dependent on what type of parity is used
- receiving device on receipt of byte counts number of 1 s
- ...odd number of 1s in even parity gives an error
/even number of 1s in odd parity gives error
(1 per -, max 3) [3]

- (ii) - odd parity is used
- byte number 5 has an even number of 1s therefore an error
- Column 4 has an even number of 1s
- Therefore the 0 in row 5, column 4 needs to be changed to 1
(1 per -, max 3) [3]

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9 (a) A B X
0 0 1
0 1 1
1 0 1
1 1 0

(1 mark for the 1,1 and 1 mark for 1, 0)

[2]

(b) A B C D Y
0 0 0 1 1
0 1 0 0 0
1 0 0 1 1
1 1 1 0 1

(1 mark for each row).

[4]