

**MARK SCHEME for the October/November 2009 question paper
for the guidance of teachers**

9691 COMPUTING

9691/12

Paper 12 (Written Paper 1), maximum raw mark 90

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- 1 (a) (i) -e.g. To transfer work from home to school/take backups of system
-small/portable/works with any computer/stores a lot of data [2]
- (ii) -e.g. To import software/to make backups of data on system/encyclopaedias/films
-large capacity/fast access times/can be used many times/re-writeable [2]
- (iii) -e.g. To play music while working/encyclopaedias/to import software
-Compatible with form of albums/large storage capacity/can not be altered [2]
(Note: Accept any sensible application)
- (b) -hard drive
-to store data files/software/operating systems [2]
(Note: Other storage may be justified but the question states 'need')
- 2 (a) (i) Software that manages the computer hardware/allows applications to run
- (ii) General purpose software/carries out a number of tasks/that would have to be done even if there was no computer.
- (iii) Software used to convert a program of instructions from one language to another
- (iv) Part of O.S. which carries out a commonplace task/housekeeping.
(1 per dot, max 4) [4]
- (b) -Many of the processes will be dangerous...
-many of the processes will be complex
-and must be supervised in real time...
-information must be immediately available
-Small number of operators and...
-there will be a large amount of information...
-which must be prioritised...
-to avoid information overload.
-Some less important data...
-e.g. relating to non time crucial processing
-should be kept for later at non busy time
-Use of priority symbols like colours/inverse video/flashing/sound alarms...
-should be minimised because overuse causes reduction in effect.
-Use of graphics to illustrate processes and effects of parameters on processes
(1 per -, max 6) [6]
- 3 (a) (i) The characters that a system can recognise/characters on the keyboard [1]
- (ii) -Each character assigned a unique binary code...
-Known as a byte/Typically 8 bits
-lower case/upper case in separate orders to allow alphabetic order
-One bit reserved for parity check.
-Meaning 128 characters can be represented
-Extended ASCII uses all 8 bits for characters, ignoring parity
(1 per -, max 3) [3]

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- (b) (i) Check input to ensure it is sensible/follows set rules for data [1]
- (ii) -Type check/character check
 -Ensure characters are all letters
 -Length check
 - >1 and <20 (e.g.) characters entered
 -Existence check
 -Compare with file to see if there is this name there
 (1 per -, max 2 pairs, max 4) [4]
- (c) 10000111
 (1 per nibble) [2]
- (d) -Multiply 250 and 10000
 -Add 10%
 -Signify that should divide by 1024...
 -Twice
 -Answer between 2.35 and 2.75
 -M bytes
 (1 per -, max 5) [5]
- (e) (i) -To keep track of numerical/currency values
 -and do automatic calculations
 -e.g. calculate fines/membership fees/library accounts
 (1 per -, max 2) (keep records of books/borrowers) [2]
- (ii) -To create slide shows for public performance
 -Allows use of sound/video/animation/...
 -e.g. to present lessons about famous authors to parties of school children
 (1 per -, max 2) [2]
- (iii) -To produce personalised letters/documents...
 -by searching file for data and inserting into standard document
 -e.g. Producing letters to members who have outstanding books
 (1 per -, max 2) [2]
- 4 (a) (i) Advantages:
 -Hardware can be shared making system cheaper to set up
 -Software can be shared making system cheaper to set up
 -Hardware and software can be shared making it possible to provide more unusual items
 -Any machine can be used for all information
 -Software installation made easier
 -More easy to manage/control/maintain
 -communication is easy between the machines
 (1 per -, max 3)
 Disadvantages:
 -Data is not as secure as when stored on stand-alone machines
 -Can be bottlenecks when peripherals are used e.g. using a shared printer.
 (1 per -, max 1) [4]

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- (ii) -If data being communicated is to be stored at receiver for future use, then the bit rate can be slow
 -If data being communicated is to be used immediately upon arrival then the bit rate used for communication must be faster than the rate at which the data is used.
 -bit rate is the number of bits per second [2]

- (b) -Modem
 -to link LAN to communication medium
 -Gateway/Router
 -to connect two different networks together
 -Firewall
 -to protect LAN from unwanted access
 -proxy server to allow one Internet connection for whole network
 (1 per -, max 4) [4]

- 5 (a) -Off-the-shelf is a generally available package
 -Custom-written is specially produced for the problem solution [2]

- (b) -Ready tested/Bug free
 -Immediately available
 -Training available
 -Staff who can use it are available
 -Cheaper because of shared development cost.
 -compatible with other software
 (1 per -, max 3) [3]

- 6 (a) -Iteration means to repeat a series of steps
 -in a given sequence
 -The steps and the sequence are shown/it is not possible to depart from the sequence
 -The sequence can be entered at any point
 -Steps can be repeated as often as is necessary.
 (1 per -, max 3, accept answer formed around the stages on the diagram) [3]

- (b) -Is solution technically feasible?
 -e.g. Does the hardware exist to automatically identify a student?
 -Is the solution economic to produce?
 -e.g. Will the extra costs make the food more expensive?
 -Is the solution economic to run?/Will it cut costs in the cafeteria?
 -e.g. Will we need to employ more people, hence increasing costs?
 -What will the social implications be?
 -e.g. Will the new system cater for the disabled students?
 -Is the skill level among staff high enough?
 -e.g. Will the cafeteria staff have to do a training course?
 -Time constraints
 -e.g. The changeover must be finished by the end of a holiday
 (1 per -, max 3 pairs, max 6) [6]

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- 7 (a) (i) -Card has a strip of magnetic material...
 -which holds data
 -in this case student ID number
 -Read by swiping through a card reader.
 (1 per -, max 2)
- (ii) -Is only activated by input of PIN at number pad...
 -which is stored in computer system, not on card / is stored on (one of the other two areas of the) magnetic stripe
 -photo ID on card
 -Ability to freeze account so items cannot be charged to it
 (1 per -, max 2) [4]
- (b) -Staff can inspect their own data...
 -at any time...
 -in order to check its accuracy
 -Access to data limited to small/named number of people...
 -Password/Physical security
 -Data up to date and accurate
 -Data erased when no longer needed
 -Only relevant data for this example is stored.
 (1 per -, max 6) [6]
- (c) (i) -Data is collected
 -Processing carried out at quiet time
 -Probably with no human intervention
 -Process is not time critical
 -Preparation of monthly statements
 (1 per -, max 2) [3]
- (ii) -Real time
 -Customer requires result as soon as data has been input [2]
- (d) E.g.
 -Report of popular/unpopular food items...
 -provided by the cumulative totals of orders made
 -Report on times that are popular among students/staff...
 -provided by mean total takings against time
 (1 per -, max 2) [2]

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8 INPUT NO_OF_SNACK
LET PRICE = ARRAY (NO_OF_SNACK)
OUTPUT PRICE
REPEAT
    INPUT COIN
    IF COIN = 1 THEN PRICE = PRICE-1
    ELSE PRICE = PRICE -5
    ENDIF
    OUTPUT PRICE
UNTIL PRICE <= 0
DISPENSE PRODUCT
IF PRICE < 0 THEN REPEAT
    DISPENSE 1 CENT COIN
    PRICE = PRICE + 1
    UNTIL PRICE = 0
ENDIF
END

```

Mark Points:

- Input snack number
- Find price in array
- Output Price (here AND in the first Repeat loop)
- REPEAT... UNTIL PRICE <= 0 (or equivalent if a flow diagram Not a For)
- Input coin (inside loop)
- Condition of coin and then calculate price
- Dispense Product
- Condition for negative price
- Loop to give change with correct condition
- Only give 1 cent coins in change
- Correct layout and end conditions
(1 per -, max 9)

[9]