

**MARK SCHEME for the October/November 2010 question paper
for the guidance of teachers**

9691 COMPUTING

9691/32

Paper 3 (Written Paper), maximum raw mark 90

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- 1 (a) Advantages:
- Access to the correct customer information can be made from any machine/terminal necessary to use the machine storing that information
 - The customer details are always up-to-date/there is only one copy of the customer file.
- Disadvantages:
- While one user is accessing or amending the file, others cannot use it/because it is necessary to maintain the integrity of the data held
 - The data is less secure/more people can see the files so less confidential/more difficult to keep files confidential to one worker.
- (2 per -, max 1 advantage and 1 disadvantage, max 4) [4]

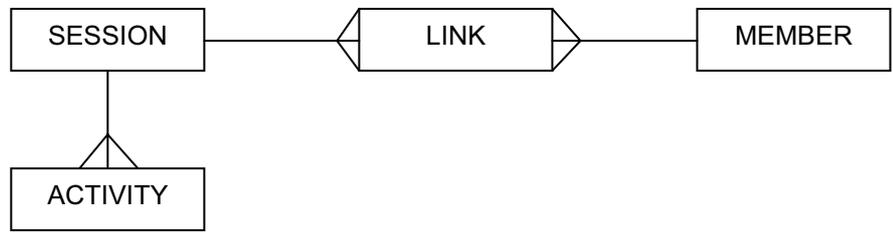
- (b) (i) - All computers in the star network are connected to the switch
 - The switch is capable of receiving a message and identifying where the message should go...
 - the message is only sent to the correct places/reducing network traffic
 (1 per -, max 2) [2]

- (ii) - Lies between the two networks
 - Passes messages from one network to the other
 - Converts data into the appropriate form for the receiving network
 (1 per -, max 2) [2]

- (iii) - Used to connect chief accountant's computer to telephone line (*not Internet*)
 - Converts between digital and analogue signals
 - Modulator/Demodulator
 (1 per -, max 2) [2]

- (c) - Information is relevant to the company/private network
 - bank of company resources
 - More chance of workers seeing information
 - Fewer people using intranet/less information available...
 - makes it easier to navigate...
 - faster to access information
 - Information more secure from hacking/viruses.
 - less unsolicited email
 (1 per -, max 4) [4]

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- Mark Points:
- All three entities represented
 - Session to Activity being one-to-many
 - Link entity between SESSION and MEMBER
 - Session to Link is one-to-many
 - Link to Member is many-to-one
- (allow 1 mark for session to member is many-to-many)
 must be a recognizable ER diagram [5]

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- 3 (a) -Single processor/control unit
-Sequential processing
-Instructions and data indistinguishable...
-can be stored together (in same memory unit).
(1 per -, max 3) [3]
- (b) (i) -Hold the data currently being processed
-Result of calculation is held in accumulator...
-before being passed to memory unit
(1 per -, max 2) [2]
- (ii) -The address of the next instruction
-Contents incremented (after being read)
-Contents changed by a jump instruction
(1 per -, max 3) [3]
- 4 (a) -Interpreter translates one instruction and runs it before translating the next.
-Compiler translates whole program before it is executed
-Interpreter maintains source code throughout run/program execution
-Compiler creates the object code and drops the source code
-Interpreter must be present in memory during run/program execution
-Compiler removed once object code produced
-Object code larger than source code
-Compiled program runs more quickly once it is translated
-interpreter produces error diagnostics as they are met
-compiler produces a file of error diagnostics at end of compilation
-interpreter makes debugging easier
-compiler needs whole program to be syntax error free to produce object code
-interpreter can execute partial programs
-compiler needs a whole block of code to run
(1 per -, max 6) [6]
- (b) -Puts each statement into form required by the syntax analyser
-Keywords are tokenised
-If keyword not in dictionary then error reported
-Programmer-defined names entered into symbol table//symbol table created.
-names not following rules create error message
-Removes unnecessary characters
(1 per -, max 5) [5]

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- 5 (a) -Software interrupt...
-e.g. generated by the current program/may need to use printer/...
-I/O interrupt...
-e.g. Initiated by I/O hardware/user pressed a key/...
-Timer interrupt...
-e.g. end of time slice
-Hardware interrupt...
-e.g. power off
(1 per -, max 2 pairs, max 4) [4]
- (b) -current process halted
-Interrupt given a priority
-Placed in queue with other interrupts to be done...
-according to priority
-When interrupt reaches top of queue it is processed // highest priority is handled first
-Contents of registers placed on stack
-values read from stack to registers.
(1 per -, max 5) [5]
- 6 Repeat
-Compare new value with root value / head
-If > root value then follow right subtree
-Else follow left subtree
-Until no subtree
-Insert new value as root of new subtree
(1 per -, max 4) [4]
- 7 (a) (i) Mantissa is 01001100
-Created by $9 \frac{1}{2} = 1001.1$
-Point moved to be in front of first 1 and 0 placed in front
Exponent is 00000100
-created by number of places point is moved
-4 = 100_2
(1 per -, max 4) [4]
- (ii) -Mantissa is 01011001
-Exponent is 00000101 [2]
- (b) -Range is decreased...
-because power of two to multiply mantissa by is decreased
-Accuracy is increased...
-because more digits/bits (are represented after the binary point). [4]

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- 8 (a) -Can have staff training sessions...
-without staff having to travel / thus saving time of employees
-Saves costs of transport/hotels/venue
-Meetings can be at any time/immediate
-Personnel do not have to have large amount of time off work to attend.
(1 per -, max 4) [4]
- (b) -Enlarges market
-now worldwide rather than just local to stores
-Opens up richer markets where higher prices can be charged
-Sells 24/7
-No need for expensive overheads
-No need to employ more sales staff for extra sales.
-possibility of larger range of goods
(1 per -, max 4) [4]
- (c) Technical:
-Designed for use by a technician/computer knowledgeable person
-Shows how the system was put together/works
-So that a technician can alter the system/correct it/maintain it
- User:
-Designed for non computer literate user of system
-Provides training guides/instructions for use
-What to do when something goes wrong.
(1 per -, max 4) [4]
- (d) *examples must refer to the scenario in the question*
- (i) -Needed to correct bugs in the system, found in operation
-e.g. Totals over \$100 are output without cents value
- (ii) -Changes to the system necessary because of external factors
-e.g. Sales tax on shoes has changed
- (iii) -Changes which enhance/improve performance of system
- e.g. A change to the sorting algorithm to speed up production of lists of most popular shoes. [6]
- 9 (i) -Data and methods are kept together
-Data can only be accessed using methods attached to it [2]
- (ii) -Computer given facts and rules
-required outcomes are described, not how to achieve them [2]
- (iii) -Instructions are one-to-one with machine code/binary
-Use of mnemonics / labels
-Memory locations can be accessed directly
(1 per -, max 2) [2]

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- 10 (a) (i) -Simultaneous use of... (*do not accept: apparently*)
-more than one processor...
- (ii) -to carry out large number of calculations...
-because the calculations are simple/similar/repetitive...
-carried out in much shorter time (compared with single processor)
-Calculations are interdependent with results of one group feeding into next calculations.
(1 per -, max 3 per dotty, max 4) [4]
- (b) Need for complex software/O.S. [1]