

**UNIVERSITY OF CAMBRIDGE INTERNATIONAL EXAMINATIONS**  
**GCE Advanced Level**

**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/it is not 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]

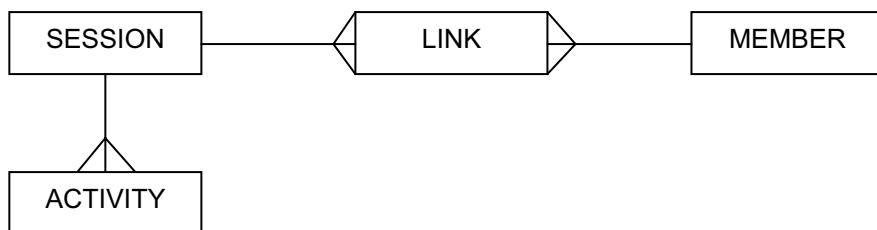
**(c) -Information is relevant to the company/private network**

- 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]

**2**



**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 recognisable 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]