

SECTION A**Answer ALL questions in this section.**

1. A school uses a local area network. Students and teachers save files on the network file server in their own directories.
 - (a) Files on the server are stored in a directory with a hierarchical structure. For example, a teacher has a file for student attendance and a student has a file for biology assignments.

Draw a diagram to show what the term 'hierarchical structure' means in this context.

(2)

(b) The students' attendance files must be validated. One method of data validation is to check that the attendance field has been completed.

(i) Name a suitable check for this purpose.

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(1)

(ii) State and describe **one** other method of data validation.

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(2)

(c) A student finds that his assignments have been deleted from his directory by another student.

(i) State and describe a method which the school could use to prevent this from happening.

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(2)

(ii) Describe how the files could be recovered.

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(2)

(Total 9 marks)

Q1



2. A company organises conferences for doctors. The company intends to use the Internet for organising and advertising the conferences.

(a) State **two** items of hardware that the company's computers need to connect to the Internet. Give a reason for each item.

Item 1

Reason

.....

Item 2

Reason

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(4)

(b) Email is an Internet service that is used by the company. State **two** other Internet services that the company could use. Give a reason in each case.

Service 1

Reason

.....

Service 2

Reason

.....

(4)

(c) The company also uses an intranet.

(i) State what an intranet is.

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(1)

(ii) Give **one** example of how the company would use this intranet.

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(1)

Q2

(Total 10 marks)



3. An organisation employs a network manager to control its computer network.

- (a) One task of the network manager is to prevent staff from installing their own software onto the network.

Describe **one** method that the network manager can use for this purpose.

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(1)

- (b) Give **four** other tasks of the network manager.

Task 1

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Task 2

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Task 3

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Task 4

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(4)

Q3

(Total 5 marks)



H 3 1 2 7 1 A 0 5 2 0

4. One task of an operating system is to load programs into memory.

Give **three** other tasks carried out by the operating system.

Task 1

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Task 2

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Task 3

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Q4

(Total 3 marks)



5. Computer models can simulate many systems. A queuing system in a supermarket is one example.

(a) Describe **one** application, other than a supermarket, where a computer model could be used.

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(2)

(b) Give **three** benefits of using computer models.

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(3)

Q5

(Total 5 marks)



H 3 1 2 7 1 A 0 7 2 0

6. Software can be purchased as an 'integrated package', sometimes known as an 'integrated suite'.

(a) State **two** types of software that could be integrated in this way.

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(1)

(b) Give an example to illustrate how an integrated package might be used.

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(2)

(c) State **two** benefits of using an integrated package.

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(2)

(Total 5 marks)

Q6



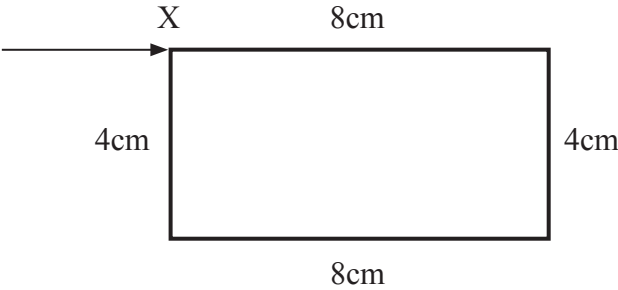
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7. A Computer-controlled plotting device uses the following instructions.

INSTRUCTION	ACTION
FD n	Move n cm forwards
BK n	Move n cm backwards
LT n	Turn left n degrees
RT n	Turn right n degrees
PU	Lift the pen off the paper
PD	Place the pen on the paper

The plotting device has been given instructions to draw the $8\text{cm} \times 4\text{cm}$ box shown. The pen is off the paper at point X and is moving in the direction shown by the arrow.

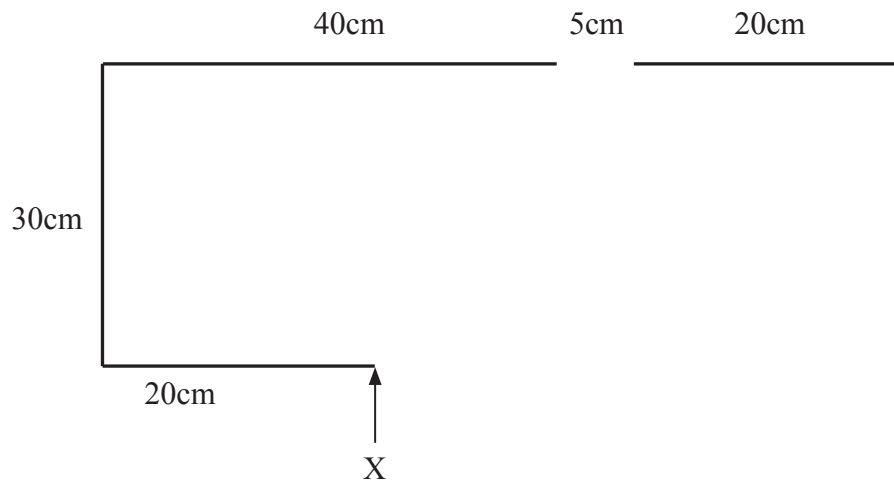


These are the instructions to draw the box:

PD
FD8
RT90
FD4
RT90
FD8
RT90
FD4



The plotting device is to be given instructions to complete the following task:



Assume that the pen is up at X and moving in the direction of the arrow. Complete the lines of instructions to draw the shape shown.

LT90

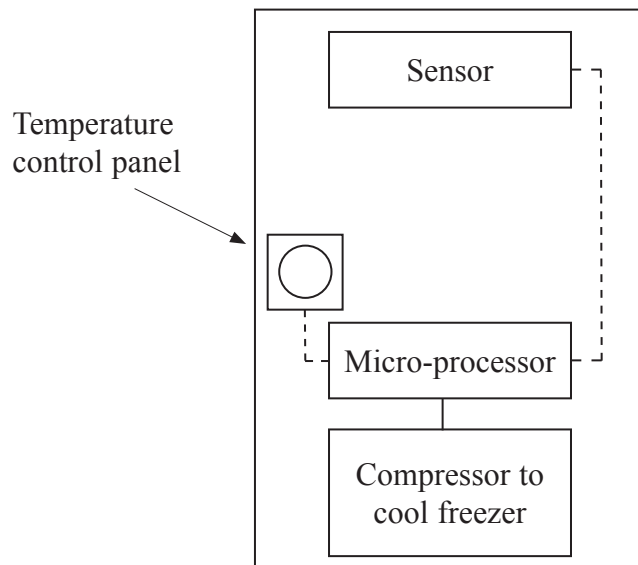
(Total 5 marks)

Q7



H 3 1 2 7 1 A 0 1 1 2 0

8. A diagram of a freezer is shown:



(a) State a suitable sensor for this application.

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(1)

(b) The freezer uses feedback. Explain how feedback works in this application.

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(3)

(c) Sometimes food is spoiled because the freezer door is left slightly open.

Draw a diagram of a control system to prevent this from happening.

(4)

Q8

(Total 8 marks)

TOTAL FOR SECTION A: 50 MARKS



H 3 1 2 7 1 A 0 1 3 2 0

SECTION B

The questions in this section refer to the case study.

A copy of the case study can be found as an insert.

Answer ALL questions in this section.

9. The following table shows incomplete details for fields in the database. Complete the table to show the data type and field length. Give a reason for each of your answers.

Field name	Data type	Field length	Reason
Address code	text	12	In the case study, Fant2332 has four letters and four digits, so type must be text. Other districts may have longer names, so length allows for an eight-letter name.
ID number			
Tax date			
Date of birth			
Licence			

Q9

(Total 12 marks)



10. (a) The content of a database may be altered by adding, deleting, or amending a record.

Give an example of each type of alteration for the database of tax records.

Adding

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Deleting

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Amending

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(3)

- (b) The LINK table contains the key fields from the OWNER and VEHICLE tables.

Explain why a key field is needed.

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(2)

- (c) Explain why it would **not** be a good idea to put the vehicle and owner details into a single table.

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(3)

Q10

(Total 8 marks)



11. To test camera measurement, ten cameras were set up on roads between Fant and a nearby town. The cameras were mounted on street lights so that they could be powered from their electricity supply.

- (a) Describe **two** methods which could be used to connect the cameras to the central computer.

Method 1

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Method 2

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(4)

- (b) To test GPS measurement, ten government vehicles in Fant were fitted with a 'black box'. The data from each black box was transferred to a laptop once a day.

Describe **two** methods which could be used to transfer the data to the laptop.

Method 1

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Method 2

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(4)

Q11

(Total 8 marks)



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blank

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- (b) Vehicle owners will be able to view their charges through a government web site and then pay on-line by transferring money from their bank accounts.

State **two** security problems which might occur and suggest a solution in each case.

Problem 1

Solution 1

.....

Problem 2

Solution 2

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(4)

Q12

(Total 11 marks)



(a) Describe the processing that takes place from when the set time is reached to when the data has been received correctly.

[illegible]

H 3 1 2 7 1 A 0 1 9 2 0

- (b) The identification signal from each black box is unique to that black box and is built into the hardware. Explain why the vehicle number is included in the data sent, even though the black box signal is unique.

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(2)

Q13

(Total 11 marks)

TOTAL FOR SECTION B: 50 MARKS

TOTAL FOR PAPER: 100 MARKS

END

