1 Name the input devices **A**, **B**, **C** and **D** using the words from the list.
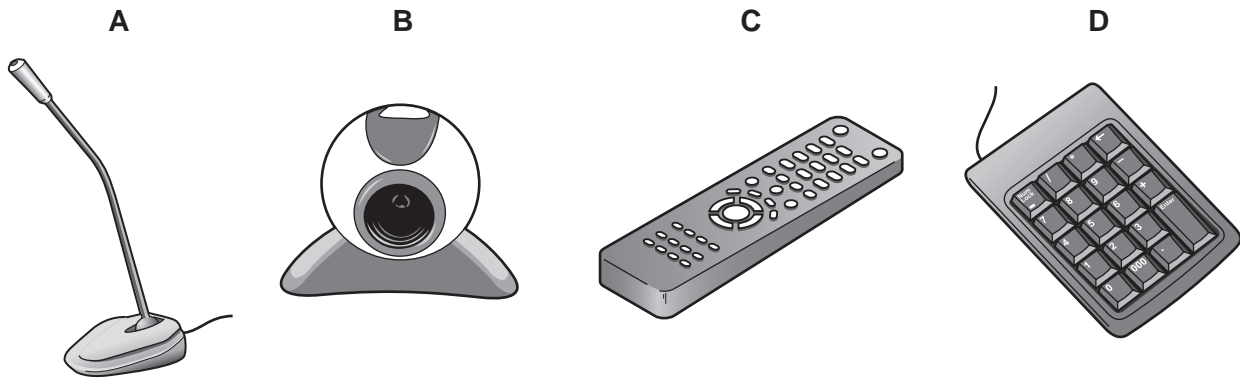
A	B	C	D

digital camera   **microphone**   **number pad**   **remote control**

scanner   **touch pad**   **trackerball**   **web cam**

A ....

B ....

C ....

D ....

[4]

2 Ring **two** items which are used for storing data.

buzzer   DVD R   joystick

magnetic tape   plotter   touch pad

[2]

3 Tick **True** or **False** next to each of these statements.

	True	False
A scanner is used to enter a PIN		
Word processing software is used to write letters		
Database software is used to create newspapers		
A command line interface uses icons to represent applications		
Sensors are used to monitor physical variables		

[5]

4   A test is marked out of 20 and recorded as an integer. Tick whether each of the following marks is an example of **abnormal** data or **extreme** data.

	Abnormal	Extreme
20		
21		
twenty		
0		

[4]

5   Name **three** network devices and for each one describe what it does.

Name   ....

Description   ....

    ....

Name   ....

Description   ....

    ....

Name   ....

Description   ....

    ....   [6]

6   Tick which of the following statements apply to traditional **LANs** and which apply to **WLANs**.

|	LANs	WLANs
Uses wireless technology to transmit data		
Faster transmission of data		
Greater security		
Is cheaper as there is less cabling		

[4]

7   A floor turtle can use the following instructions:

INSTRUCTION	MEANING
FORWARD *n*	Move *n* mm forward
BACKWARD *n*	Move *n* mm backward
LEFT *t*	Turn left *t* degrees
RIGHT *t*	Turn right *t* degrees
PENUP	Lift the pen
PENDOWN	Lower the pen
REPEAT *n*	Repeat the following instructions *n* times
END REPEAT	Finish the REPEAT loop

NOT TO SCALE

45°

100 mm

Start

60°

80 mm

200 mm
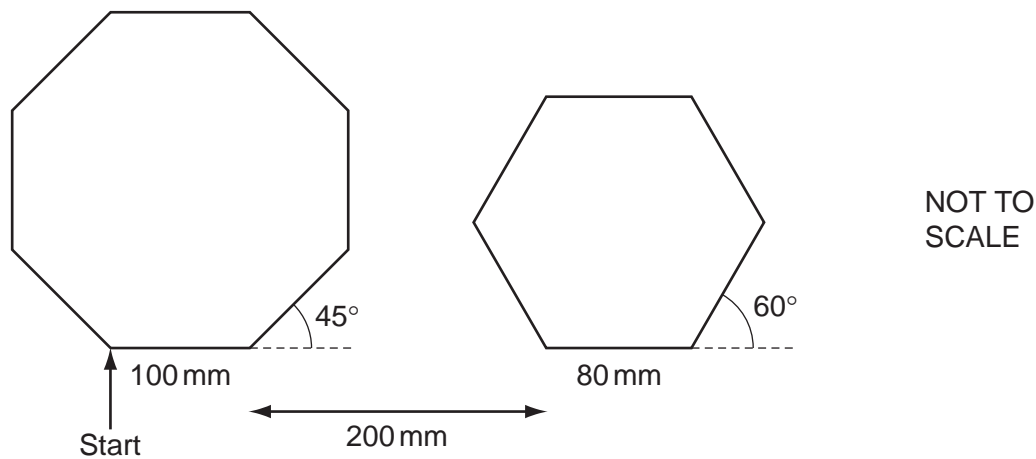
Complete the set of instructions to draw this shape by filling in the blank lines.

PENDOWN

RIGHT   90

REPEAT   ....

....   100

LEFT   ....

....

PENUP

FORWARD   300

PENDOWN

REPEAT   ....

....   80

....   60

....

[8]

8   Use the most appropriate phrase from the list below to complete the sentences.

retouch photographs.

print out photographs.

input candidate examination answers.

input data from a magnetic stripe.

store high definition copies of movies.

open windows in a greenhouse.

input data from a chip.

input temperature in a microprocessor controlled greenhouse.

(i)   A blu-ray disc is used to

....

(ii)   A graphics tablet is used to

....

(iii) An inkjet printer is used to

....

(iv) A motor is used to

....

(v)   An Optical Mark Reader is used to

....

[5]

9   Explain why computer systems have both backing storage and RAM.

....

....

....

....

....

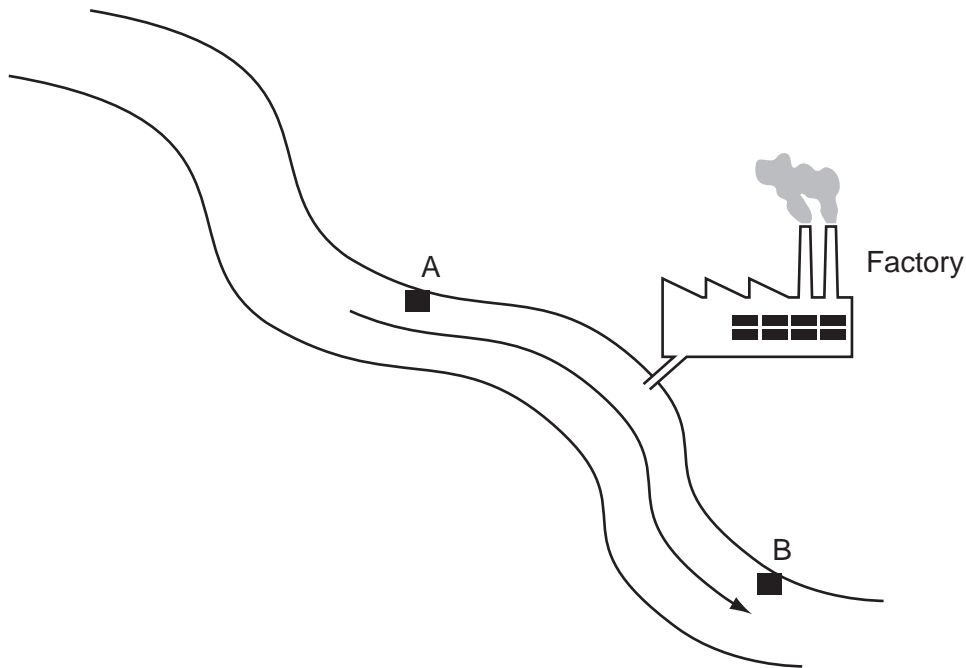... [3]

10 Below is a diagram of a river running past a chemical factory. The same types of sensor, connected to a computer in the factory are placed at A and B to monitor pollution of the river by the factory.

(a) Name **three** sensors which would need to be placed at both A and B.

1 ....

2 ....

3 .... [3]

(b) Describe how the computer would monitor the level of pollution in the river.

....

....

....

....

....

....

....

....

.... [5]

11 (a) Doctors often use expert systems to help them to diagnose illnesses.
Name **four** components of a typical expert system.

1 ....

2 ....

3 ....

4 .... [4]

(b) Name **two** other applications which involve the use of expert systems.

1 ....

....

2 ....

.... [2]

12 Name and describe **three** validation checks which could be carried out on a 16-digit credit card number when it is typed into a computer.

Name ....

Description ....

....

Name ....

Description ....

....

Name ....

Description ....

.... [6]

13 Describe how the following health problems can arise due to the use of computers. Give a different cause for each.

RSI in the wrists ....

....

RSI in the fingers ....

....

Headaches ....

....

Back pain ....

.... [4]

14 A bank is looking into a variety of security measures to protect its customers' data.
Describe **three** types of authentication technique they could use and for each give a benefit
and a drawback.

Technique 1 ....

....

Benefit ....

....

Drawback ....

....

Technique 2 ....

....

Benefit ....

....

Drawback ....

....

Technique 3 ....

....

Benefit ....

....

Drawback ....

.... [9]

15 Gita has employed Johann, a systems analyst, to create a new database system for her car sales business. She only sells cars made by Rock and only the models Feisty, Mendo and Galactica in red, blue or gold. Most of the cars have air conditioning but some do not. She sells 3, 4 and 5 door cars.

(a) Give a reason why would it not be sensible to have a Make field in the database.

....

.... [1]

(b) Complete the design table below giving the field names which would be used in the database and describing the most appropriate validation check which could be carried out on each field.

Field name	Validation check
Model	

[7]

(c) Discuss verification and validation.

....

....

....

....

....

....

....

....

....

....

.... [6]

....

16 A travel agent keeps a spreadsheet record of his customers' holiday bookings to various destinations. This is split into two sheets. Sheet 1 contains the Code for each destination. Sheet 2 contains a list of his customer bookings so far.

	A	B
1	Code	Destination
2	BAH	Bahamas
3	COZ	Cozumel
4	EGY	Egypt
5	IND	India
6	MAL	Maldives
7	MEX	Mexico

Sheet 1

(Commas are used as delimiters in the functions shown below.)

	A	B	C
1	Destination	Code	Trips
2	=VLOOKUP(B2,Sheet1!$A$2:$B$7,2,0)	BAH	=COUNTIF($A$8:$A$18,B2)
3	=VLOOKUP(B3,Sheet1!$A$2:$B$7,2,0)	EGY	=COUNTIF($A$8:$A$18,B3)
4	=VLOOKUP(B4,Sheet1!$A$2:$B$7,2,0)	MAL	=COUNTIF($A$8:$A$18,B4)
5	=VLOOKUP(B5,Sheet1!$A$2:$B$7,2,0)	MEX	=COUNTIF($A$8:$A$18,B5)
6			
7	Destination code of holidays booked so far this year		
8	EGY		
9	MAL		
10	BAH		
11	MEX		
12	MAL		
13	BAH		
14	EGY		
15	EGY		
16	MAL		
17	EGY		
18	BAH		

Sheet 2

(a) Explain what the function in cell A2 in Sheet 2 does.

....

....

....

....

....

.... [3]

(b) What destination would you expect to see in cell A4 in Sheet 2?

.... [1]

(c) Explain what the function in cell C2 in Sheet 2 does.

....

....

....

....

....

.... [3]

(d) What value would you expect to see in cell C3 in Sheet 2?

.... [1]

(e) Spreadsheets are often used to produce computer models.
Discuss the benefits and drawbacks of computer modelling.

....

....

....

....

....

....

....

.... [4]

1 A Microphone [1]
   B Webcam [1]
   C Remote control [1]
   D Number pad [1]

2 buzzer (DVD R) joystick [1]

  (magnetic tape) plotter touch pad [1]

3

	True	False
A scanner is used to enter a PIN		✓
Word processing software is used to write letters	✓	
Database software is used to create newspapers		✓
A command line interface uses icons to represent applications		✓
Sensors are used to monitor physical variables	✓	

[5]

4

	Abnormal	Extreme
20		✓
21	✓	
twenty	✓	
0		✓

[4]

5   **Three** pairs from:
    Hub
    Broadcasts data packets to computers in a LAN

    Router
    Connects LANs to a WAN/Internet

    Switch
    Directs data packets to specific computers

    NIC
    Enables computers to be connected to a network

    Bridge
    Connects networks/LANs together/Directs data packets to specific networks

    Proxy server
    Stores web pages for faster re-use by computers/can act as a firewall

    Modem
    Modulates data and demodulates phone signals   [6]

6

	LAN	WLAN
Uses wireless technology to transmit data		✓
Faster transmission of data	✓	
Greater security	✓	
Is cheaper as there is less cabling		✓

[4]

7   *PEN DOWN*   *FORWARD*   *300*

    RIGHT   *90*   *PEN DOWN*

    REPEAT   **8**   *REPEAT*   **6**

    FORWARD   *100*   **FORWARD**   *80*

    LEFT   **45**   **LEFT**   *60*

    END REPEAT   **END REPEAT**

    PENUP

    1 mark for each correct statement   [8]

8   A blu ray disc is used to   **store high definition copies of movies**

    A graphics tablet is used to   **retouch photographs**

    An inkjet printer is used to   **print out photographs**

    A motor is used to   **open windows in a greenhouse**

    An Optical Mark Reader is used to   **input candidate examination answers**   [5]

9   **Three** from:
    If computer is switched off work in RAM goes but backing storage stores data for future use
    More likely that data is accidentally deleted in RAM
    RAM is more expensive than backing storage <u>per unit of memory</u>
    RAM is bulkier than backing storage <u>per unit of memory</u>
    RAM provides faster access than backing storage
    Software package may be so large that it is physically impossible for RAM to store it.
    Data may need to be transferred from one computer to another and can't do that with RAM   [3]

10 **(a)** **Three** from:
    Temperature sensor
    Light sensor
    pH sensor
    O_2 sensor
    CO_2 sensor   [3]

    (b) **Five** from:
    The sensors feed back data to microprocessor/computer
    Data is converted from Analogue to Digital
    Readings from A are compared with those from B...
    .....by the computer/microprocessor
    Differences are printed out
    Graphs are <u>automatically</u> produced by computer showing values from A and B..
    ...plotted against time
    Process is continuous.   [5]

11 **(a)** **Four** from:
    User interface
    Rules base
    Knowledge base
    Inference engine   [4]

    (b) **Two** from:
    Engine car fault diagnosis
    Prospecting
    Tax
    Careers
    Chess games
    Animal/plant classification   [2]

12 **Three** pairs from:
Length check
Checks there are exactly 16 characters

Invalid character/type check
Checks all characters entered are digits

Check digit
Single digit calculated from other digits appended to these, computer carries out fresh calculation on digit and compares answer with original check digit.

Existency check
Is the card number on the database   [6]

13 RSI in the wrists – caused by repetitive typing/prolonged gripping of mouse   [1]
RSI in the fingers – caused by repetitive clicking of mouse   [1]
Headaches – staring at the screen for too long   [1]
Back pain – sitting in the same position for long periods   [1]

14 **Three** matched triples from:

User ID and password
Benefit – each user ID could be unique/only user will know the password/data can only be accessed by person who knows the password/Password can be changed frequently to avoid hackers guessing them/Unsuccessful logins can throw you out of the system
Drawback – user might forget password/keylogging software can be used to intercept it

Biometrics
Benefit – each user has unique biometrics
Drawback – equipment is expensive to buy/may be difficult or expensive to get equipment to user

Magnetic/chip card with PIN
Benefit – Hacker needs to have the card and know the PIN
Drawback – can lose the card/can forget PIN

TAN
Benefit – Always changing so a hacker would not be able to use it even if they intercepted it when user typed it in.
Drawback – need to have card and remember PIN and use it within a short period of time.   [9]

15 (a) Would always be the same contents/waste space putting in duplicated field   [1]

(b)

Field name	Validation check
Model	Must be Feisty or Mendo or Galactica
Colour	Must be red, blue or gold
Air conditioning	Boolean check - Must be yes or no
Number of doors	Range check >2 AND <6 / >=3 AND <=5

[7]

(c) Six from:
Validation is the checking that data is reasonable or acceptable
Verification is checking that data has been accurately copied from one medium to another.
Verification does not check that data is correct
If original data is incorrect it will still be incorrect after it has been copied accurately
Validation does not check that data is correct
If, for example, data is incorrect but within a given range, a range check won't reject it
Validation will pick up errors that verification does not
Verification will pick up errors that validation does not
Verification can sometimes be carried out by the user
Validation is always carried out by the computer   [6]

16 (a) Three from:
It looks through the cells A2 to B7…
…in Sheet 1
Until it finds the value equal to the contents B2 (BAH) in sheet 2
B2 in sheet 2 contains BAH
It records the corresponding value from column 2 of sheet 1
Produces Bahamas   [3]

(b) Maldives   [1]

(c) Three from:
It looks through A8 to A18
Cell B2 contains the code BAH
Checks whether A8 to A18 contains the code BAH/contents of B2
Counts all the cells where there is a match
Produces the answer 3.   [3]

(d) 4   [1]

(e) **Four** from:
Benefits
Real thing may be too expensive to build
Real thing requires too large a time scale
Real thing would be too wasteful of materials
Real thing is too vast a scale
Easier to change data/variables
Costs less to change data/variables
The real thing may be impossible to access/create
Real thing may be too dangerous
You can test predictions more easily/model can make predictions more accurately
you can ask many whatif questions which would be impractical in real life

Drawbacks
Can never allow for all eventualities
Difficult to exactly recreate a lifelike situation
Hardware and software may be expensive
Workers will need to be trained to use the system

Max. 3 drawbacks or benefits   [4]