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

Touchpad  Trackerball  Mouse  Keyboard  Bar Code Reader

2 Tick true or false next to each of these statements.

A control program is used to produce a business letter  false
Spreadsheets can be used to produce business accounts  true
Using computers for long periods of time is good for your back  false
Magnetic stripe readers are used for reading data from bank cheques  false
CD ROMs hold more data than DVD ROMs  false

3 Give three features of a graphical user interface.

Feature 1 Use of icons
Feature 2 Use of menus
Feature 3 Use of windows

4 Ring two items which are used to store data.

Buzzer  CD ROM  Monitor

Mouse  Floppy disc  Scanner

5 Complete each sentence below using one item from the list.

(a) Data about the details of a tin of beans is stored on the tin using a bar code
(b) Data about a bank account is stored on a credit card on a magnetic stripe
(c) A full system backup of 40GB would be made using a magnetic tape
(d) High quality permanent output can be produced using a laser printer

6 A floor turtle can use the following instructions:

<table>
<thead>
<tr>
<th>INSTRUCTION</th>
<th>MEANING</th>
</tr>
</thead>
<tbody>
<tr>
<td>FORWARD n</td>
<td>Move n mm forward</td>
</tr>
<tr>
<td>BACKWARD n</td>
<td>Move n mm backward</td>
</tr>
<tr>
<td>LEFT t</td>
<td>Turn left t degrees</td>
</tr>
<tr>
<td>RIGHT t</td>
<td>Turn right t degrees</td>
</tr>
<tr>
<td>PENUP</td>
<td>Lift the pen</td>
</tr>
<tr>
<td>PENDOWN</td>
<td>Lower the pen</td>
</tr>
<tr>
<td>REPEAT n</td>
<td>Repeat the following instructions n times</td>
</tr>
<tr>
<td>END REPEAT</td>
<td>Finish the REPEAT loop</td>
</tr>
</tbody>
</table>
7 RAM and ROM are types of storage.
(a) Describe what is meant by RAM and ROM.

1. **RAM** [2]
   - Random access memory
   - Volatile memory / lost when power is lost
   - Can be changed / can be written to and read from

2. **ROM** [2]
   - Read only memory
   - Non volatile memory / cannot be changed / can only be read from
   - Permanent memory / is not lost when power is lost

(b) Give one way a computer uses RAM. [1]

Used to hold data currently in use
Used to hold programs currently in use

8 Michael wishes to make a copy of his Geography coursework which is stored on the school computer system. He wants to take it home to finish it for homework. He can borrow a CD RW from school but he has a 128 Mb memory stick of his own.

(a) Give two advantages of using the CD RW. [2]

1. Can store more data than the memory stick
2. Cheaper to replace (not just ‘cheaper’ on its own)

(b) Give two advantages of using the memory stick. [2]

1. More compact / easier to carry
2. Faster access to data / Faster data transfer
3. More robust / difficult to damage

9 Complete the following sentences using the output devices listed below.

Graph plotter   Laser printer   Dot matrix printer

(a) A garage using multi-part stationery with carbon copies would need

Dot matrix printer
(b) An architect’s office producing house plans using A0 size paper would use
Graph plotter
(c) A student printing out coursework needing high quality printouts would use
Laser printer

10 A manager of the head office of a large company has decided to spend money on linking all its computers into an intranet.
(a) What is an intranet and what would be the benefits to the head office of having one?[3]
INTernal Restricted Access NETwork which is a A network of computers / LAN by default Solely within a company or organization, only used within company’ employees with restricted access using user ID and a password
Benefits:
- Good security for confidential information
- Secure email communication

(b) The manager would like her workers to have access to the Internet. She is told that she will need a modem. What does a modem do and why is it needed? [3]
Modulates & demodulates information / converts analogue to digital / digital to analogue
Internet connects computers using phone lines
Phone system is analogue
Computer is digital
Therefore conversion is necessary
(c) Give two items the workers will need to type into a computer in order to log on to the network.
1 user name / id
2 password [2]
(d) The benefit of being connected to the Internet is that information can be sent from head office to the different branches. Some of this information will need to be encrypted.
1. What is meant by encryption? [2]
Changes data so that it appears to be meaningless
Needs a decryption key to be understood
2. Explain why encryption is needed. [2]
Provides security for sensitive data
Protects against results of unauthorised access / hacking
Prevents data from being understood by hackers

11 A company has asked a customer to sign and send a confidential document immediately. The customer decides not to use post but can’t decide whether to send the document by fax or email attachment.
(a) Give one advantage of using a fax. [1]
Faxed signed document is legally acceptable
Can’t be hacked into it
Can’t be affected by viruses

(b) Give two disadvantages of using a fax. [2]
Fax can be seen by anyone in the company / not confidential
Paper can jam in the fax machine
May not be readable when it arrives
Receiver’s fax line may be continually engaged
Receiver’s fax may be out of paper
Receiver’s fax may not be switched on

Prepared by Mrs. Magda M. Kamel & Eng. Gamal Orphy
M: 01001025852
12. The manager of a car showroom uses a database to store data about cars he sells. This is part of the database.

(a) How many records are there in this part of the database? [1] 
7 records

(b) How many fields are there in this part of the database? [1] 
5 fields

(c) The records shown are to be sorted in descending order of size of engine. What will be the registration of the first record in the database after it has been sorted? [1] 
BFK 297

(d) Give the name of a field that contains numeric data. [1] 
Size of engine / Price

(e) Identify the field type of the ‘model’ field. [1] 
Text/Alphanumeric

(f) Which field would be the key field? [1] 
Registration

13. Many hackers have tried to infect other people’s computers with viruses.

(a) Describe what is meant by hacking. [2] 
Unauthorised attempting to gain access to a computer system in intention to steal data or delete data or plant virus

(b) Describe what is meant by a virus. [2] 
A program: Designed to make a computer system unreliable / crash / delete data
Copies itself between computers / within one computer

(c) Describe how viruses can be prevented. [2] 
Virus checker / virus killer
Do not open email attachments
Do not use floppy discs/CDs/DVDs/memory sticks you don’t know the origin of
Do not download files from the Internet

14. Put a tick in the column which best describes the type of processing used in the following applications. [4]

<table>
<thead>
<tr>
<th>Application</th>
<th>Type of Processing</th>
</tr>
</thead>
<tbody>
<tr>
<td>Robots on a car assembly line</td>
<td>Real time</td>
</tr>
<tr>
<td>Producing credit card bills</td>
<td>Batch</td>
</tr>
<tr>
<td>Booking a cinema seat using a computerised booking system.</td>
<td>Online</td>
</tr>
<tr>
<td>Launching a rocket to the moon</td>
<td>Real time</td>
</tr>
</tbody>
</table>

15. A systems analyst has been asked by a doctor to computerise the records she keeps about her patients. He must first of all collect information about the existing system.

(a) Name three methods he could use to collect this information. [3]

- Observation
- Questionnaires
- Interviews
- Collecting documents

(b) Having collected this information the systems analyst must now produce a screen input form which the doctor’s assistant could use for typing in each patient’s details. Design a suitable screen input form for inputting the details of one patient. [5]

<table>
<thead>
<tr>
<th>Patient number</th>
</tr>
</thead>
<tbody>
<tr>
<td>Personal data (name, address, phone no., fax no., email address, work phone number, next of kin, religion)</td>
</tr>
<tr>
<td>Medical History with at least 3 lines allowed for completion</td>
</tr>
<tr>
<td>Information fills the page</td>
</tr>
</tbody>
</table>

(c) After the assistant has typed in the data it will need to be verified. Describe two methods of verifying data. [2]

1. Typing in the data twice and comparing it
2. Visual verification
(d) This data needs to be stored in a database. Describe three features of the structure of the database that the systems analyst will need to design. [3]

Field length
Field/data type
Validation rules
Field name
Record length
Number of tables (in relational database)
File/table names
Identify key field
Relationships/links to other tables

(e) Once the whole system has been designed it will need to be implemented. Describe two methods of implementation. [2]

Parallel running
Direct changeover
Phased implementation
Pilot running

(f) Write down two reasons why one of the methods you gave in (e) is better than the other. [2]

Parallel running
Two from:
- There is a backup/fallback system in case of malfunction
- Time can be taken in correcting malfunctions
- Can train staff gradually

Direct changeover
Two from:
- Time is not wasted in changeover
- Cost effective; cheaper as you don’t have to pay two sets of staff
- System is tested rigorously before implementation
- Less likely to malfunction

Phased implementation
Two from:
- If system malfunctions only small part of business affected
- Don’t have to pay two sets of staff
- Can make sure system works before extending it

Pilot running
Two from:
- Gives the chance to report how system work before full implementation
- Don’t have to pay two sets of staff
- Allow for training staff

(g) After a system is implemented, it is evaluated. Give two reasons why a system should be evaluated. [2]

To make sure user requirements have been met
To identify any shortcomings
To identify possible improvements
16 Workers in a car factory are paid weekly. Their pay is calculated by multiplying the number of hours worked by the rate of pay. Tax is then deducted. Below is one record from the transaction file which tells the computer the worker's payroll number and how many hours they have worked.

<table>
<thead>
<tr>
<th>Payroll number</th>
<th>Hours worked</th>
</tr>
</thead>
<tbody>
<tr>
<td>432175</td>
<td>42</td>
</tr>
</tbody>
</table>

Here is part of the master file.

<table>
<thead>
<tr>
<th>Payroll number</th>
<th>Name</th>
<th>Rate per hour (£)</th>
<th>Tax rate</th>
</tr>
</thead>
<tbody>
<tr>
<td>361453</td>
<td>Me Te Loan</td>
<td>18.50</td>
<td>27%</td>
</tr>
<tr>
<td>295685</td>
<td>Mohammed Ali</td>
<td>15.35</td>
<td>27%</td>
</tr>
<tr>
<td>198564</td>
<td>Alan Smith</td>
<td>7.35</td>
<td>27%</td>
</tr>
<tr>
<td>432175</td>
<td>Jaswinder Dhillon</td>
<td>17.35</td>
<td>27%</td>
</tr>
<tr>
<td>671235</td>
<td>Francois Millard</td>
<td>16.85</td>
<td>27%</td>
</tr>
</tbody>
</table>

(a) Using these examples, describe the computer processing which will take place in order to produce this worker’s payslip. [5]

1. The payroll number/432175 is read from the transaction file
2. Each record is read from the master file
3. The payroll number is compared
4. Until the matching record/432175 is found
5. The number of hours/42 is read (from the transaction file)
6. The rate per hour/17.35 is read (from the master file)
7. These are multiplied together
8. The tax rate/27% is read (from the master file)
9. Tax is calculated
10. Subtracted from the wage
11. Name/ Jaswinder Dhillon is read (from the master file)
12. Workers details printed on payslip

(b) Before the transaction file is processed the data must be validated. Name and describe a suitable validation check for the: [4]

1. Payroll number: Length check No less than AND no more than 6 characters
   OR Range check Less than 1000000 AND greater than 99999
2. Hours worked Range check Less than 100 AND greater than 0

(c) The processing of the transaction file involves reading one record at a time. What type of access is this called? [1]

Serial access

(d) Certain types of processing of the master file involve accessing individual records quickly.

1. Which would be the most suitable magnetic medium for storing the master file? [1]

Magnetic disc

2. What type of access is this called? [1] direct access

(e) The workers also have personal information stored about them on a computer database.

Give examples of when the company would need to:

1. amend a record
2. insert a record
3. delete a record [3]

1. name/address/phone number changes
2. new worker starts
3. worker leaves/is sacked/dies
17 A burglar alarm system is used to detect when a burglar has entered a house. Name two sensors which could be used to detect the burglar’s presence. For each one say how it is used to do this. [4]

<table>
<thead>
<tr>
<th>Pressure pad</th>
<th>Detects weight of burglar</th>
</tr>
</thead>
<tbody>
<tr>
<td>Light/infra red sensor</td>
<td>Detects broken beam</td>
</tr>
<tr>
<td>Contact sensor</td>
<td>Detects door/window opening</td>
</tr>
<tr>
<td>Temperature sensor</td>
<td>Detects body heat</td>
</tr>
<tr>
<td>Sound sensor</td>
<td>Detects any noise made by burglar</td>
</tr>
</tbody>
</table>

18 Environmentalists plan to test a fast flowing river for pollution. Give three advantages of using a computer to do this rather than doing it manually. [3]

- More accurate
- Less dangerous
- Doesn’t forget
- Results/graphs automatically produced

19 Expert systems are used in mineral exploration.
(a) Name two other uses of expert systems. [2]

- Car engine fault diagnosis
- Medical diagnosis
- Chess games

(b) For one of your answers for (a), describe how such a system would be created. [4]

- Potential users interviewed
- Potential users given questionnaires
- Existing documents examined
- User requirements decided
- System specification decided
- Knowledge base designed / created
- Inference engine designed / created
- Design rule base / created
- Designing a method of displaying the results
- Hardware chosen
20 Many banks now allow their customers to manage their accounts on-line. Discuss this development. In your answer give the advantages and disadvantages to the bank as well as the advantages and disadvantages to the customer. [6]

<table>
<thead>
<tr>
<th>Bank</th>
<th>Advantages:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>maximum of two marks from:</td>
</tr>
<tr>
<td></td>
<td>- Fewer workers needed - less wages</td>
</tr>
<tr>
<td></td>
<td>- Fewer branches needed - less rental</td>
</tr>
<tr>
<td></td>
<td>- Workers can be less qualified - lower wages</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Bank</th>
<th>Disadvantages:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum of two marks from:</td>
</tr>
<tr>
<td></td>
<td>- Customer dissatisfaction - lose business</td>
</tr>
<tr>
<td></td>
<td>- Initial large expenditure on redundancies</td>
</tr>
<tr>
<td></td>
<td>- Initial large expenditure on retraining</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer</th>
<th>Advantages:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum of two marks from:</td>
</tr>
<tr>
<td></td>
<td>- Don't have to spend money on traveling to the bank</td>
</tr>
<tr>
<td></td>
<td>- Don't have to spend time traveling to the bank</td>
</tr>
<tr>
<td></td>
<td>- Easier to transfer money from one account to another</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Customer</th>
<th>Disadvantages:</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Maximum of two marks from:</td>
</tr>
<tr>
<td></td>
<td>- Hackers could hack into your account</td>
</tr>
<tr>
<td></td>
<td>- Loss of personal touch</td>
</tr>
<tr>
<td></td>
<td>- Cannot withdraw money</td>
</tr>
</tbody>
</table>