1 Ring **two** input devices.

- keyboard
- plotter
- touch screen
- monitor

2 Ring **two** items which are used to store files of data.

- compact disc
- graphics tablet
- modem
- sensor

3 Ring **two** items which can easily taken from one computer and loaded into another computer.

- CD ROM
- floppy disc
- RAM
- operating a system
- wide area network

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

- a virus
- a web page
- data logging
- control
- e-mail
- evaluation
- MICR
- photocopier
- unsolicited mail

- A program which can damage another program is called **a virus**
- Clearing cheques is done using **MICR**
- Comparing your solution to a problem with your original design is **evaluation**
- Sending a document from your home computer to another computer is done using **e-mail**

5 Tick **two** benefits of using computers to store medical records.

**Benefits usually one of the following: quick search, less storage, edit/amend, control**

<table>
<thead>
<tr>
<th>Benefit</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Doctors know the names of the patients.</td>
<td>V</td>
</tr>
<tr>
<td>It is quick to find a patient’s record.</td>
<td>V</td>
</tr>
<tr>
<td>Doctors can give out correct medicine</td>
<td></td>
</tr>
<tr>
<td>It uses less storage space.</td>
<td>V</td>
</tr>
<tr>
<td>Doctors have more information about a patient.</td>
<td></td>
</tr>
<tr>
<td>Doctors can perform more operations.</td>
<td></td>
</tr>
</tbody>
</table>

6 A software company is producing a new car racing game.

a) Ring **two** items which will be designed by the programmer before creating the program.

- screen layout
- microchips
- user instructions
- sample runs
- memory
- program structure

b) A keyboard is used for entering text. State two other input devices which would be particularly suitable for playing the game. Two from:

- Mouse, Joystick, Paddle, Tracker ball/trackball, Steering wheel
c) The company decides to sell the game on a CD ROM instead of many floppy discs. State three reasons why it should do this. Three from:
   - CD can hold large video clips.
   - Easier to install from CD ROM.
   - CD storage capacity is far larger than floppy discs.
   - Cheaper to produce one CD than many floppy discs.
   - Sell better because people think only good programs come on CD ROM.
   - Other companies do it.

7 Tick whether the following statements are TRUE or FALSE

<table>
<thead>
<tr>
<th>Statement</th>
<th>TRUE</th>
<th>FALSE</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wearing glasses when looking at a monitor cures eyestrain.</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Computer users should take regular breaks.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>A plastic cover over the keyboard prevents the screen flickering.</td>
<td>✔</td>
<td>✔</td>
</tr>
<tr>
<td>A wrist rest will help prevent strain when typing.</td>
<td>✔</td>
<td>✔</td>
</tr>
</tbody>
</table>

8 A small company buys a computer to keep records of sales.

a) For the first six months the company uses the old method of record keeping as well as using the computer. State one reason for doing this.
   - To make sure that the computer system is producing the correct results.

b) The company stores its records in a database on a hard disc. State the type of access needed to retrieve a single record quickly.
   - Direct access/random access. (one record can be accessed directly)

c) State what the management must do once the new system is in place before the operators start using the system. One from:
   - Learn to use the data-handling program; staff needs to get to know how the system works.
   - Training, before using the system the staff needs to be trained.

9 A school records details of pupils on a computer database. The following data are stored. Surname, Forename, Form, Age, Home Address.

a) i) State one reason why it is not advisable to store a pupil’s age.
   - Age always change, so data needs to be amended all the time.
   - It will have to be changed every year.

ii) State how you would overcome this problem.
   - Store/use the date of birth of the pupil as it does not change/never change.

iii) State why you would use more than one field for storing the home address.
   - To be able to sort/organise the file records on parts of the address such as district or area.

b) The secretary has to type the details into the database. State two ways of verifying the data.
   1 Double entry and compare results visually
   2 Double entry and compare results by computer program

Note: Using old methods at the same time with the computer system (parallel run) gives the chance to test that the new system is producing the correct results without any risks.
c) Name a device which could be used to input a photograph of a pupil into the database.
   Digital camera, Scanner, Video camera. [1]

d) The school registers its data. Describe two rules from the Data Protection Act that the school must comply with. Two from:
   - Information shall be obtained fairly.
   - Information shall be obtained lawfully.
   - Data should be kept securely.
   - Data held only for one or more specified and lawful purpose.
   - Data shall not be used for anything other than that purpose.
   - Data shall not be disclosed for anything other than that purpose.
   - Data held for any purpose shall be adequate in relation to that purpose.
   - Data held for any purpose shall be relevant in relation to that purpose.
   - Data held for any purpose shall not be excessive in relation to that purpose.
   - Data shall be accurate/correct/valid and up-to-date.
   - Data shall not be kept for longer than necessary. [2]

Note: for individuals you may apply the following: Any individual is entitled to
- Be informed by any user if he holds personal data about him
- Have access to such data as appropriate
- Have such data corrected, amended or erase/deleted

10 Complete the sentences.
   a) Multi-choice examination papers are marked using **Optical Mark Recognition (OMR)**
   b) **A bar-code** reader is used in a library to check out books quickly.
   c) A single item is accessed from hard disc. This is known as **direct** access.

11 Tick two applications which use **batch processing**.

<table>
<thead>
<tr>
<th>Application</th>
<th>□</th>
</tr>
</thead>
<tbody>
<tr>
<td>Booking a flight at a travel agent.</td>
<td>v</td>
</tr>
<tr>
<td>Producing gas bills.</td>
<td></td>
</tr>
<tr>
<td>Sending out reminders for overdue books.</td>
<td>v</td>
</tr>
<tr>
<td>Withdrawing money from a cash point.</td>
<td></td>
</tr>
<tr>
<td>Air traffic control.</td>
<td></td>
</tr>
<tr>
<td>Monitoring a patient’s condition in hospital.</td>
<td></td>
</tr>
</tbody>
</table>

Batch processing **data recorded and updated on regular basis such as weekly/monthly basis**
Real-time **update data on the spot of data recording (such as reservation system)**
On-line **working with server / main data computer**
The following question is under the following Rules
4 items of personal details 2 marks, 2/3 items 1 mark, customer number 1 mark, order details 1 mark, method of payment, 1 mark.
Each item must have appropriate data entry box to gain a mark.

12 A mail order company keeps details of phone orders on computer. When customers ring up with their orders the phone operators use a screen input form to collect details of –
The customer;
Their order;
Payment methods
New customers are given a customer number.

Design a screen input form which the manager could use for typing in the new customer’s details. The answer here varies from one student to another here below one example, it does not mean that other than the example is invalid.

Here you put a suitable screen title such as:
Customer Order Details Data Entry Screen

<table>
<thead>
<tr>
<th>Customer ID.:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Customer name</td>
</tr>
<tr>
<td>Customer Address</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>ITEM</th>
<th>Description</th>
<th>Balance</th>
<th>Order</th>
</tr>
</thead>
</table>

<table>
<thead>
<tr>
<th>Payment Method:</th>
<th>Cash</th>
<th>CR. Card</th>
<th>Cheque</th>
</tr>
</thead>
</table>

[Update] [Search] [Save] [Delete] [Exit] [Submit] [Menu] [Help]
13 Computers are now widely used in supermarkets.
   a) State two ways in which data about the goods may be entered into the point of sales (POS) terminals.
   b) Customers can pay for their goods using credit cards. The computer checks each card. State two types of check made. Two from: Credit card not reported stolen, Valid card, Credit limit not exceeded, Expiry date has not been exceeded
   c) State three advantages of supermarkets using Point of Sale (POS) technology. Three from:
      • Fewer queues in checkout points/Rate of people through the checkouts would be much slower without bar code systems
      • Re-ordering of goods would have to be done by hand - automatic re-ordering of goods is possible
      • Without the bar codes prices would have to be placed on every item of food
      • Logging of stock levels would have to be done manually
      • Re-ordering done automatically
      • Payment through EFT (Electronic Fund Transfer)
      • Switch or direct debit cards can be used by swiping them
      • Management statistics can be produced very quickly
      • Checkout staff can have their work rate recorded
      • More accuracy [3]

14 Employees of a company have to enter 4 digit code numbers into a data-handling package.
   a) State two validation checks which could be used to check that the validation of the code numbers is working. Two from:
      • Check if number is not less than zero
      • Range check; check the number within a specified range
      • Presence check; existence check
      • Type Check; if all the characters are digits
      • Length Check; if there are less than four characters entered
   Answer must be a description of how the check is done
   Note: do not propose check digit in this case as the number is very small; usually the need for check digit arises with large numbers only [2]
   b) If the code number was not validated, incorrect data will be entered into the database causing problems. State one example of such a problem. One from:
      • Incorrect data leads to not reliable output
      • Incorrect data could cause problems with calculations later
      • Incorrect data could cause the system to crash [1]

15 A bicycle company uses robots in its factory which have an arm with a paint spray can be attached.
   a) State two ways in which the computer can be instructed to control the robot arm.
      By a computer program giving instruction to control the arm
      A human can paint the bicycle frame using the arm and the computer records all the movements; by recording the required robot moves done with the help of human. [2]
(b) State two advantages to the company of using a robot to do the painting. Two from:
   - Robots paint the same standard every time
   - Can work in hazardous/dangerous conditions - Human jobs lost due to robots
   - Saving money/running cost - once bought they do not have to be paid - No industrial
   - disputes - Greater productivity - Greater accuracy

(c) State two disadvantages to the company of using a robot to do the painting. Two from:
   - If the painting line gets out-of-synchronisation the whole process will collapse
   - If the robot runs out of paint it may carry on working
   - Robots have to be reprogrammed when there is a small/slight change
   - Not adaptable like humans - Expensive start up costs
   - Computer crash would halt production

16 Many companies around the world use electronic conferencing to communicate with their employees around the world.
(a) Describe electronic conferencing.
   - Employees are connected to an on-line system at the same time using computers (1)
   - Members contribute to the conversation by typing their text that appears on everyone else’s screen (1)
   - Real time images of the people in the conference who has a web camera may appear on the screen like a TV picture (1)
   - This type of connection needs communication software at both ends to make the conferencing work (1 mark) and different hardware such as: video/microphone/speaker (1 mark maximum)

(b) Describe the advantages and disadvantages of using electronic conferencing. Three from:
   - Companies do not have to transport their employees to a common meeting place saving travel and conference room costs and time (cost of travel eliminated - Time saved because of non-travelling)
   - Instant communication with all employees
   - Each employee can contribute equally to the conference
   - Time zone differences for participants might create a problem

17(a) Write down one application which uses an expert system.
   One example of an expert system, e.g. medical diagnosis, car fault diagnosis, mineral/oil prospecting, tax/legal/ careers advice and counselling, chess game.

(b) Describe how the expert system would be created. Explanation should include at least 4:
   - Gathering data from experts.
   - Designing database/knowledge base, not system design.
   - Creating a data base/knowledge base, of knowledge.
   - Creating a structure to relate each item in the database(knowledge base).
   - Creating an interrogation technique to get at the data (Inference engine).
   - Designing a method of displaying the results.
18 A library is considering changing its computer system. The initial investigation has taken place and data about the old system has been collected. Describe the steps taken in the analysis and design of the new system.

**Points should be made from:**

- Analyse the output required
- Analyse the input required
- Work out what information the new system needs
- Analyse the processing required
- Analyse the constraints of the system - cost, time
- Breakdown the task
- Estimate the resources required
- A diagram of the solution (block diagram or system flowchart)
- Design appropriate forms for data capture
- Design the internal organisation of data
- Select appropriate hardware
- Select appropriate software
- Design screen displays
- Design reports or design output
- Define suitable validation checks

**Example:** Analysis should consider current system fact-findings and recording, analyse input and output required from the new system, analyse the processing needed to get the required information, design the necessary data forms, input screen, output layout, design system dataflow and consider validation checks, select the software that will be used.

19 With the easy availability of computers and phones and fax machines, many employees now have the facilities to work from home. Discuss the implications for:

(a) The employer

- Lower costs – less office space needed.
- It is difficult to monitor staff working habits.
- It is difficult to supervise staff remotely
- It is less opportunity to have staff meetings.
- It is less likely to be able to contact staff in emergency. [2]

(b) The employee

- Don’t have to waste time travelling to work.
- Free to/Can organise their day better.
- It is less stress than being a commuter.
- Difficult to obtain help when having difficulty with task (no colleagues to share ideas with), lack for help or advice from colleagues and mgmt.
- Might have to buy expensive equipment to do their jobs and to keep up.
- Might lapse into bad habits if left to own devices. [3]