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

   A: Scanner  B: Dot matrix printer  C: Hard disc drive  D: Graphics tablet  E: Multimedia projector

2. Ring two items which are storage devices.
   - Bar code reader
   - Keyboard
   - Laser printer
   - Memory Stick
   - Mouse
   - Zip disc drive

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

<table>
<thead>
<tr>
<th>Statement</th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>Dot matrix printers produce high quality output</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Laser printers are very noisy</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Graph plotters are used when extremely large hard copy is required</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Inkjet printers are used where continuous stationery is required</td>
<td>✓</td>
<td>✓</td>
</tr>
</tbody>
</table>

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

   (a) Options from a menu can be selected using **A mouse**

   (b) Magnetic ink characters are used to record information on **A bank cheque**

   (c) A very large file which needs to be moved from one computer to another for editing can be stored on **A memory stick**

   (d) Sound can be input to a computer using **A microphone**

   [4]

5. Tick True or False for the following statements about RAM and ROM.

<table>
<thead>
<tr>
<th>Statement</th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>RAM is not volatile</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>ROM is used to store the BIOS of a computer</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>The data in ROM is easier to change than that in RAM</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>RAM is used to store the data the user is currently working on</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>
6 A floor turtle can use the following instructions:

Triangle:
1 mark for a correct loop e.g. REPEAT 3, END REPEAT
1 mark for RIGHT 120

Backward sequence
1 mark for PENUP, BACKWARD 80, PENDOWN

Square:
1 mark for a correct loop e.g. REPEAT 4, END REPEAT
1 mark for FORWARD 100 coming immediately after RIGHT 90 as given

7 Tick whether the following problems are Health problems or Safety problems related to the use of computers.

<table>
<thead>
<tr>
<th>Problem</th>
<th>Health</th>
<th>Safety</th>
</tr>
</thead>
<tbody>
<tr>
<td>Headaches caused by prolonged use</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Trailing wires in a computer room</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>RSI though continual typing</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Back problems through bad posture</td>
<td>✔</td>
<td></td>
</tr>
<tr>
<td>Too many plugs in an electric socket</td>
<td></td>
<td>✔</td>
</tr>
<tr>
<td>Drinking water whilst using a computer</td>
<td></td>
<td>✔</td>
</tr>
</tbody>
</table>
8. Tick three applications which use on-line processing.

<table>
<thead>
<tr>
<th>Producing utility bills</th>
</tr>
</thead>
<tbody>
<tr>
<td>Paying for goods at an EFTPOS terminal</td>
</tr>
<tr>
<td>Making an airline booking</td>
</tr>
<tr>
<td>Producing monthly payrolls</td>
</tr>
<tr>
<td>Monitoring a patient’s condition in a hospital</td>
</tr>
<tr>
<td>Reading data from bank cheques</td>
</tr>
</tbody>
</table>

9. A systems analyst has been asked by a librarian to develop a computer system to store information about books and borrowers. After the existing system is analysed the new system will be designed. The first item to be designed will be the input screen.

(a) Name four items of data about one borrower, apart from the number of books borrowed, that would be input using this screen.

Four from:
ID number/Borrower number
Photo of borrower
Name
Address
Post code
Email address
Gender/Title
Date of Birth
Max. two from:
Home Phone number
Work Phone number
Mobile Phone number

(b) Describe four features of a well designed input screen.

Data fills the screen
Clearly defined input area for each record
Appropriate spacing for each field
Back button/arrow/previous record facility
Forward button/arrow/next record facility
Number of record is on screen
Submit button/facility
First record button/facility
Last record button/facility
An easy to read font/font size/
A sensible font colour/background colour
Easy to follow instructions for completing screen/help icon
No overlapping of items
Exit button/return to homepage button/facility
(c) The librarian will need to type in data about each book from existing records. In order to prevent typing errors the data will be verified. Describe two methods of verification which could be used.

Double entry/data entered twice
Computer compares the two versions

Visual checking/verification
Typed in data is compared with original data

(d) After the system is designed it will need to be implemented and then tested.

No borrower can take out more than 6 books. Describe the three types of test data that can be used, using a number of books as an example for each.

Normal data is data which is within an acceptable range/is usual for the situation
Any example between 1 and 6

Extreme data is data which is at either end of a normal range of data
Examples: 1, 6

Abnormal data is data which is outside the acceptable range/is of the wrong data type
Example: any negative number or number greater than 6 or text example

(e) The system must now be evaluated. Tick three reasons why this is done.

| Improvements can be made | ✓ |
| The hardware and software can be specified | ✓ |
| Limitations of the system can be identified | ✓ |
| To see how many books are required | ✓ |
| To make sure the user is satisfied with the system | ✓ |
| So that program coding can be written | |

(f) After the system is implemented the librarian will be given technical documentation and user documentation. Name three different components of each type of documentation.

**Technical documentation**

Program listing
Programming language
Flowchart/algorithm
List of variables
File structure
Purpose of the system/program
Input format or example
Output format or example
Hardware requirements
Software requirements
Sample runs/test runs
Known bugs/possible errors
Validation rules
**User documentation**

How to load software/run software/install software.
How to save a file.
How to search
How to sort
How to print
How to add records
How to delete/edit records
Purpose of the system/program (only if not mentioned in technical documentation)
Input format or example (only if not mentioned in technical documentation)
Output format or example (only if not mentioned in technical documentation)
Hardware requirements (only if not mentioned in technical documentation)
Software requirements (only if not mentioned in technical documentation)
Sample runs (only if not mentioned in technical documentation)
Error messages (only if not mentioned in technical documentation)
Error handling/Troubleshooting guide/Contact details/help line/FAQ/Tutorials

10 A supermarket uses a Chip and PIN system at its checkouts. Put the following steps in order using the numbers 2 to 8. The first step has already been done for you.

<table>
<thead>
<tr>
<th>The customer types in the PIN</th>
<th>3</th>
</tr>
</thead>
<tbody>
<tr>
<td>If the PIN and the number stored in the chip are the same go onto the next step</td>
<td>5</td>
</tr>
<tr>
<td>The customer’s account is checked to see if it has sufficient funds</td>
<td>7</td>
</tr>
<tr>
<td>The card is inserted into the reader</td>
<td>1</td>
</tr>
<tr>
<td>The PIN number is compared with that stored in the chip</td>
<td>4</td>
</tr>
<tr>
<td>The transaction is authorized</td>
<td>8</td>
</tr>
<tr>
<td>The device checks if the card is valid</td>
<td>2</td>
</tr>
<tr>
<td>The supermarket computer contacts the customer’s bank computer</td>
<td>6</td>
</tr>
</tbody>
</table>

11 A car repair centre uses an expert system to help diagnose car engine faults.
   (a) Describe the inputs, outputs and processing of this system.

Interactive user screen appears
Details of car type are entered
Questions about engine problems are asked/on-board computer connected to expert system
Answers to questions/engine problems are typed in
Inference engine searches
Searches the Knowledge base using the Rules (base)
Suggested probabilities of faults are output
In the form of a report to the mechanic/on screen output
(b) Give two other examples of situations where expert systems might be used.
Medical diagnosis
Mineral prospecting
Chess games
Plant identification
Animal identification
Tax advice
Careers advice/guidance
Insurance
Drug efficacy

12. An automatic washing machine is controlled by a microprocessor.
   (a) Tick two sensors which would have to be used in the machine.

<table>
<thead>
<tr>
<th>Sensor</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pressure sensor</td>
<td>✓</td>
</tr>
<tr>
<td>Proximity sensor</td>
<td></td>
</tr>
<tr>
<td>Temperature sensor</td>
<td>✓</td>
</tr>
<tr>
<td>Oxygen sensor</td>
<td></td>
</tr>
</tbody>
</table>

(b) Explain why computers are unable to read the data directly from these sensors.
Computers work in digital
Sensors produce analogue data

(c) Describe how the microprocessor uses data from the sensors to control the washing machine.
Microprocessor continually monitors sensors
Data is converted from analogue to digital/ADC is used
Compares water level with pre-programmed value
If water level reached microprocessor switches off valve
Else valve left on/switched on
Compares temperature with pre-programmed value
If temperature higher microprocessor switches off heater
Else heater left on/switched on
Compares weight of clothes with pre-programmed value
If clothes too heavy microprocessor sounds alarm/stops machine/motor stops running
Else cycle continues/motor starts

(d) There are many microprocessor controlled devices in the modern home. Describe the effects of these on people’s lifestyles.
Microprocessor controlled devices do much of housework
Do not need to do many things manually
Do not need to be in the house when food is cooking
Do not need to be in the house when clothes are being washed
Can leave their home to go shopping/work at any time of the day
Greater social interaction/more family time
More time to go out/more leisure time/more time to do other things/work
Are able to do other leisure activities when convenient to them
Can lead to unhealthy eating due to dependency on ready meals
Can lead to laziness/lack of fitness
Can encourage a healthy lifestyle because of smart fridges analyzing food constituents
13 (a) Name two network devices that could be used to connect a LAN to a WAN
   Modem
   Router
(b) Describe the differences between a WAN and a LAN
Five from:
   WAN is a wide area network
   WAN covers a large geographical area/worldwide
   The Internet is a WAN
   LAN is a Local Area Network
   LAN covers a small area such as one building/A school network is a LAN
   A WAN consists of connected LANs
   More difficult to share peripherals using a WAN

14 A sports shop owner uses a database to store data about the products he sells. This is part
   of the database.

<table>
<thead>
<tr>
<th>Bar code</th>
<th>Brand name</th>
<th>Product type</th>
<th>Number in stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>1825698000040</td>
<td>Kino</td>
<td>Football shirt</td>
<td>22</td>
</tr>
<tr>
<td>2266127153625</td>
<td>Dasdida</td>
<td>Hockey boots</td>
<td>15</td>
</tr>
<tr>
<td>3756643392895</td>
<td>Brooke</td>
<td>Netball</td>
<td>32</td>
</tr>
<tr>
<td>3014232068474</td>
<td>Borem</td>
<td>Rugby shorts</td>
<td>26</td>
</tr>
<tr>
<td>5010223708943</td>
<td>Mupe</td>
<td>Running shoes</td>
<td>12</td>
</tr>
</tbody>
</table>

(a) How many fields are there in this part of the database?
Four fields
(b) How many records are there in this part of the database?
Five records
(c) Give the name of the field that is already sorted in order.
Product type
(d) The records shown are to be sorted in ascending order of number in stock. What will
    be the brand name of the first record in the database after it has been sorted?
Mupe
(e) Which field would be the key field?
Bar code
(f) Name and describe the most suitable validation check which would be carried out on
    the Number in stock field.
Range check
Values less than 0 (or ‘lower limit’) or more than an upper limit
Will be rejected/not allowed/must be within

15 Tick three essential components of a computer to be used in a video conferencing system.

<table>
<thead>
<tr>
<th>Component</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>Graph plotter</td>
<td></td>
</tr>
<tr>
<td>Trackerball</td>
<td>✔</td>
</tr>
<tr>
<td>Microphone</td>
<td>✔</td>
</tr>
<tr>
<td>Speakers</td>
<td>✔</td>
</tr>
<tr>
<td>Optical mark reader</td>
<td></td>
</tr>
<tr>
<td>Web cam</td>
<td>✔</td>
</tr>
</tbody>
</table>
16. On-line banking is used by many customers. Describe three methods of making sure that the data transferred is secure.

Three from:
- **User ID/Passwords/PIN**
  - User ID/Password/PIN entered is compared with that held on system/never tell anyone your password/regularly change password/make it not easy to guess/only person who knows password can access account
- **Encryption**
  - Data is scrambled up/key must be known to unscramble it/prevents people from understanding data
- **Firewall**
  - Prevents unauthorised users/computers from accessing network
- **Digital certificates**
  - Transactions are digitally signed/authenticated/transaction is linked to the PC being used to carry out online banking
- **Anti Spyware**
  - Prevents spyware from invading your computer and gaining personal information
- **Make sure website is secure**
  - Locked padlock is present on display

17. A school encourages its students to use the Internet for research purposes. Discuss the issues relating to such use with reference to the reliability and desirability of the information.

**Drawbacks:**
- Not all information is accurate
- Some information is purely for advertising/selling purposes
- Might need proxy server to prevent access to certain types of site
- Some information is pornographic
- Anyone can put information on the Internet
- Much of the information on the Internet is not filtered
- Need to identify the validity of the author
- Need to be careful about whether information is fact or opinion
- Information can be biased
- Results from search engine could be skewed because of sponsorship/marketing
- Internet is not policed
- So much information available which might be unreliable

**Benefits:**
- Wide range of information to select (desirable/reliable information)
- Able to search quickly (using search engines) to find (reliable/desirable) information
- Information can be downloaded and edited (to make it desirable/reliable)
- Can use the final part of a URL to identify reliability
- Information can be up to date/real time so reliable
- .ac, .gov, .org are usually fairly reliable
- Can compare information from sites to see if it is reliable