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

A Trackerball
B Digital camera
C Light pen
D Joystick

2 Ring two items which are output devices.

- Buzzer
- DVD RAM
- Magnetic tape
- Plotter
- Joystick
- Touch pad

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>A number pad is used to enter a PIN</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Presentation software is used to write letters</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Database software is used to create queries</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>A Graphical User Interface uses icons to represent applications</td>
<td>✓</td>
<td></td>
</tr>
<tr>
<td>Sensors are used to store data</td>
<td>✓</td>
<td></td>
</tr>
</tbody>
</table>

4 Tick whether each of the following is a method of validation or verification.

<table>
<thead>
<tr>
<th>Method</th>
<th>Validation</th>
<th>Verification</th>
</tr>
</thead>
<tbody>
<tr>
<td>A computer comparing two versions of the data</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Using check digits</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Applying a length check</td>
<td>✓</td>
<td>✓</td>
</tr>
<tr>
<td>Performing a range check</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Typing in data twice</td>
<td></td>
<td>✓</td>
</tr>
<tr>
<td>Visually comparing data on screen with the original data source</td>
<td></td>
<td>✓</td>
</tr>
</tbody>
</table>
5 A desktop computer is already used in an office which does not have an internet connection.

(a) Name two items of hardware which could enable the computer to be connected to a network.

1 Switch .................................................................................................................................................. [2]

2 Hub ..................................................................................................................................................... [2]

(b) Name one item of hardware which would enable the network to be connected to the internet.

Router .................................................................................................................................................... [1]

6 A school keeps records of every student including details of their names, addresses, phone numbers and dates of birth. Using this information, define the terms file, field and record.

File  A file is a collection of records: all the students data names, addresses, phone numbers and dates of birth ..................................................................................................................................................

Field  A field is one item of information such as: name/address/phone number/date of birth ..................................................................................................................................................

Record  A record is all the information about one student: name, address, phone numbers and dates of birth .................................................................................................................................................. [3]

7 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>PENC</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>
8 Describe the batch processing of bank cheques.

Cheques are collected together throughout the day
During the course of the day
Cheques are then processed all at once using MICR (Magnetic Ink Character Reader)
Cheques are processed overnight
Bank accounts updated following morning
No human intervention

9 Multi-national companies often use video conferencing rather than face to face meetings.

(a) Give three advantages of video conferencing.

- Workers can use own office so documents do not get lost in transit
- Workers do not have to carry around bulky documents/equipment
- Company can call meeting at short notice
- Employees can work from home
- Company does not have to pay travelling expenses
- Company does not have to pay hotel expenses
- Company does not have to pay for conference room facilities
- Travelling time is saved
- Might be dangerous to fly/travel
- Disabled people may find it difficult to travel so it will be very convenient for them

(b) Give three disadvantages of video conferencing.

- Takes time to train employees/ Takes time for workers to learn new technology
- Difficult to call international meetings because of time differences
- Initial cost of hardware
- Equipment can break down
- Strength of signal/bandwidth/lip sync can be a problem/connection can be lost/power cuts
- Loss of personal/social contact
- Can’t sign original documents
A car showroom uses a database to store information about the cars it has sold. Part of this database is shown above.

(a) (i) Which field stores Boolean data?

**Air conditioning**

(ii) Give one reason why this data type is used.

- The field only contains Y or N (two possibilities)
- It saves time entering data
- It reduces errors when inputting data
- It’s easier to validate
- It saves storage space for the file

(b) (i) Which field stores numeric data?

**Number sold**

(iii) Give one reason why this data type is used.

- Might need to calculate total of all cars sold
- Easier to validate
- Might need to produce a graph
- Can easily find best selling make

11 Describe the differences between RAM and ROM.

- ROM cannot be changed/RAM can be changed
- RAM can be read from and written to
- ROM is read only memory and RAM is random access memory
- ROM holds instructions that need to be unchanged such as BIOS/program cycles in a washing machine/program instructions in games
- RAM holds the work that is being currently done by the user
- ROM is non-volatile/RAM is volatile

12 Doctors often use expert systems to diagnose illnesses of patients. Describe how expert systems are used in this process.

- Symptoms are entered through answers to questions
- Uses interactive interface using questions based on previous responses
- Expert system analyses data using Inference engine which compares symptoms
- Compares with those held in knowledge base using rules base
- Matches are found
- Suggests probabilities/possible diagnoses

13 A student wishes to store data on an optical storage medium. List two optical media and give one advantage and one disadvantage of using optical media when compared with fixed hard discs.

- CD
- DVD
- Blu-ray
- DVD RAM
One advantage from: More portable/cheaper to buy
One disadvantage: Limited capacity/slower access times/slower transfer rates/can be more easily lost/can be more easily stolen/can be more easily scratched

14 A large company has a LAN. The manager of the company wants to replace it with a WLAN. Explain the differences between a LAN and a WLAN, giving an advantage and a disadvantage of a WLAN.

LAN uses cables to transmit data
WLAN uses wireless technology

Advantage
Cheaper as less cabling/new workstations can be sited anywhere/different devices can be connected easily

Disadvantage
Slower transfer rates/limited transmission distance/physical obstacles can limit transmission/less security

15 Computers can cause health problems. Identify two of these problems and for each problem write down a method which would help you avoid it. Do not use the same method for both answers.

Problem
- Headaches (from staring at screen continuously)
Prevention method
Use anti-glare screen  note: (headaches/eyestrain)

Problem
- Eyestrain (from staring at screen continuously)
Prevention method
Use anti-glare screen  note: (headaches/eyestrain)

Problem
- RSI in fingers (from continual typing/repetitive clicking of mouse)
Use ergonomic keyboard (RSI)

Problem
- RSI in wrists (from continual typing/repetitive clicking of mouse)
Prevention method
Use wrist rests (RSI)

Problem
- Backache from sitting in same position all day
Prevention method
Use straight backed chair/maintain good posture (backache)

Prevention method for all health problems
Take regular breaks

16 In online banking data can be misused by hackers. Name three types of security measure which can be used to help to prevent this. For each one give an advantage and a disadvantage.

Three matched triples from:
Authentication technique/User ID and Passwords/PIN/memorable data
Advantage
Only person who knows password can access data
Disadvantage
Key logging software can detect key presses/passwords can be intercepted by expert hackers/user can forget password

Encryption
Advantage
Data is scrambled into unreadable form/only person/computer with key can understand data
Disadvantage
Data can still be deleted from system

Firewall
Advantage
Only allowed users/computers can access data
Disadvantage
It is not necessarily the hacker that is excluded but the computer/hackers might use an acceptable computer

Digital certificates
Advantage
Only computer with certificate can access data
Disadvantage
Can be expensive to purchase

Anti Spyware
Advantage
Prevents spyware from invading your computer and gaining personal information
Disadvantage
Doesn’t work for all invasions/needs to be continually updated

TANs (Transaction Authentication Number)
Advantage
It is one time password to authorise a financial transaction as a double layer of security
Disadvantage
PIN can be forgotten/if misused can generate wrong TAN

17 A systems analyst has been asked by a school librarian to update the computer system she uses to keep records about her books.

(a) The systems analyst must first of all collect information about the existing system. Describe three methods which could be used to collect this information.

- Observing the librarian/students/teachers using the current system
- Questionnaires are distributed to librarian/students/teachers asking questions about the current system
- Interviewing the librarian/students/teachers asking questions about the current system
- Examining documents from the current system

(b) The systems analyst must now produce a screen input form which the librarian could use for typing in each book’s details. Design a suitable screen input form to enter the details of one book. It should contain appropriate spacing for each field, as well as navigation aids.
(c) Name three methods which would be used in a library to input data about books or borrowers.

- Keyboard to type in data
- A bar code (reader)
- A magnetic stripe (reader) – for borrowers
- Touch screen
- Biometric methods (Finger print) – for borrowers
- RFID (Radio-frequency identification) – for borrowers

18 A new computer system storing examination results out of 100 is to be tested using a range of test data. For each item of test data below, name the type of test data used, explaining your choice. Use each type once only.

(a) 65 Normal data
Data is between 0 and 100/within the given range

(b) 100 Extreme data
Data is on the boundary of given range

(c) 121 Abnormal data
Data is outside the given range
19 When a new system is implemented, documentation is provided with it. Identify the two different types of documentation produced and name two different components in each.

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/install/run 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
- Error handling
- Tutorials
- Troubleshooting guide/Contact details/help line/FAQ

20 A student wishes to use the internet in order to research a topic. Discuss how the student can assess the reliability and bias of a website.

Six from:
- Check if site has excessive advertising
- Check if the advertising related only to its own products
- Can use the final part of a URL to identify reliability: .edu, .ac, .gov, .org are usually fairly reliable
- Can compare information from reliable sites to see if it is reliable
- Can compare with information from reliable/authenticated/text books
- Check if site is endorsed by a legitimate body/ See if responsible bodies have endorsed the site
- Check if it has links to other reliable sites/unreliable sites
- Check if it has testimonials/ credentials
- Check the date of the last update
- Check if there are links to and from the website to and from well known reliable websites
- Checking the author’s credentials