1. Name the devices A, B, C, D and E using the words from the list. [5]

A: Trackerball  
B: Web cam  
C: Magnetic stripe reader  
D: Joystick  
E: DVD drive

2. Ring two items which are output devices. [2]

- Bar code reader
- Buzzer
- Motor
- Mouse
- Zip disc drive

3. Tick true or false next to each of these statements. [5]

<table>
<thead>
<tr>
<th>Statement</th>
<th>True</th>
<th>False</th>
</tr>
</thead>
<tbody>
<tr>
<td>Presentation software would be used to process measuring data</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Database software would be used to store payroll records</td>
<td></td>
<td></td>
</tr>
<tr>
<td>An Optical Character Reader is used to read information from bank cheques</td>
<td></td>
<td></td>
</tr>
<tr>
<td>DVDs can store more information than CDs</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Speakers are used to input information to a multimedia presentation</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

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

(a) Text is typed into a word processor using **a keyboard**
(b) Optically read marks are used to record information on **a school register**
(c) A very small file which needed to be moved from one computer to another for editing would be stored on **a floppy disc**
(d) Very large printouts would be obtained using **a graph plotter**

5. Copyright law applies whenever you buy software. Give three actions that would break copyright law [3]

- Giving software copies to others without the owner’s permission
- Making a copy of a disk without the owner’s permission
- Selling copies of the software without the owner’s permission
- Using the software on a network when the licence does not allow it
- Renting out the software on a network when the licence does not allow it
- Renting out the software/sharing software with others without the permission of the owner
- Using the copyright name on other software
- Amending software/using parts of code in own programs without permission
- Buying pirated software
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 (t) degrees left</td>
</tr>
<tr>
<td>RIGHT (t)</td>
<td>Turn (t) degrees right</td>
</tr>
<tr>
<td>PENUP</td>
<td>Lift the pen</td>
</tr>
<tr>
<td>PENDOWN</td>
<td>Lower the pen</td>
</tr>
</tbody>
</table>

7. RAM and ROM are types of storage.
   (a) Describe the differences between RAM and ROM.
   **ROM** Read only memory cannot be changed/permanent/RAM is temporary memory
   **RAM** Random access memory can be read from and written to
   RAM is volatile/ROM is non-volatile
   ROM is read only memory and RAM is random access memory
   (b) Explain what RAM and ROM are used for.
   **ROM** stores basic input output system (BIOS) or a program cycles in a washing machine or a program instructions in games
   **RAM** holds the data currently being used by the user

8. The use of computers can lead to safety problems. Describe two safety problems and how they could be prevented.

   **Problem 1** electrocution
   **Prevention** RCB installed/cable insulation
   **Problem 2** trailing cables
   **Prevention** put cables in ducts or cover cables with carpets or length of cabling could be reduced by using wireless systems such as: WiFi
   **Problem** – heavy equipment falling
   **Prevention** – use of large and sturdy tables
   **Problem** – fire
   **Prevention** – having appropriate type of extinguisher with regular maintenance of equipment and establish good ventilation
9. A systems analyst has been asked by a travel agent to computerise the records she keeps about available holidays.

(a) The systems analyst must produce a screen input form which the travel agent could use for typing in the details of each holiday. Design a suitable screen input form for inputting the details of one holiday.

<table>
<thead>
<tr>
<th>Destination/country:</th>
<th>Hotel name/resort name:</th>
</tr>
</thead>
<tbody>
<tr>
<td>Length of stay:</td>
<td></td>
</tr>
<tr>
<td>Resort features:</td>
<td></td>
</tr>
<tr>
<td>Type of room:</td>
<td>click to select the type</td>
</tr>
<tr>
<td>Star rating:</td>
<td>1 2 3 4 5 tick the appropriate box</td>
</tr>
<tr>
<td>Name of nearest airport to resort:</td>
<td></td>
</tr>
<tr>
<td>Places of interest to visit:</td>
<td>click to add places</td>
</tr>
<tr>
<td>Type of holiday:</td>
<td>click to select the type</td>
</tr>
<tr>
<td>Dates of availability:</td>
<td>Day  Month  Year</td>
</tr>
<tr>
<td>Reference number of holiday:</td>
<td></td>
</tr>
<tr>
<td>Price of holiday:</td>
<td>£</td>
</tr>
</tbody>
</table>

(b) After the travel agent has typed in the data it will need to be verified. Explain two ways in which this could be done.

- **Data is entered twice and two data versions are compared by computer and if versions are different, data rejected if versions are match then data accepted**
- **Data on screen/in system is visually compared with that on data capture form**
(c) Describe the differences between validation and verification giving two examples of validation checks. 

Validation is applying checks on data entered within the acceptable, reasonable a given range while verification is checking versions of data have been entered identically or it is checking data has been copied correctly from one source to another (3) 

Validation examples: Range check, Check digit, control total, hash total, Invalid character check/type check, format check/input mask, Presence check, Existence check, Length check (2) 

(d) After the system is designed it will need to be implemented. Discuss methods by which the system could be implemented and give reasons why the systems analyst might choose one of the methods and not the others. 

To implement the system there are: 

Parallel running/implementation where information is secured and there is always a second copy as having both old and new systems working at the same time till the new system proves itself but it have to pay two sets of workers, this will be chosen when cost is not an issue and need data to be in secured status 

Phased implementation where still have most of system running if things go wrong with the new system and no extra expense of running two systems together but may lose some data if things go wrong, this will be used when time is not an issue 

Direct implementation/changeover which is time effective as time is not lost and do not have expense of running two systems together but if things go wrong lose all data, this will be used in control system or when the old system became unusable 

Pilot running gives the chance to report how system work before full implementation but it is a slow method of implementation; this will be used when time is not an issue 

(e) After the system is implemented the travel agent will be given documentation to go with it. This will consist of technical documentation and user documentation. Explain the purpose of each type of documentation and two different items that each type of documentation will contain. 

Technical documentation 

Purpose: it helps programmers, systems designers and analysts to make improvements to system, repair system or maintain system as long as the system lasts 

Technical documentation contents: 

◆ Program listing 
◆ Flowchart/algorithm 
◆ List of variables 
◆ File structure 
◆ Purpose of the system 
◆ Purpose of the program 
◆ Screen layouts 
◆ Print formats 
◆ Hardware requirements 
◆ Software requirements 
◆ Sample runs 
◆ Known bugs 
◆ Error messages 
◆ Validation routines
User documentation
Purpose: it helps users to learn how to use system and use it smoothly and successfully
User documentation contents:
◆ How to load software/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
◆ Troubleshooting guide
◆ Screen layouts (only if not mentioned in technical documentation)
◆ Error messages (only if not mentioned in technical documentation)
◆ Print formats (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)
◆ Tutorials

10. Robotics is now used in the production of motor cars. Describe the effects this had on the workers who used to manually produce cars. [3]

   Increased unemployment because Workers can be deskill
   Increased employment and employer have had to retrain the workers for other jobs
   Less noise/more pleasant environment and safer environment as jobs will be tend to be less heavy lifting/healthier work

11. (a) A group of doctors want to have an expert system to help them with their diagnoses. Describe how such a system would be created and evaluated. [5]

   Expert system creation steps:
   ◆ Doctors interviewed for user requirements
   ◆ Data is collected from experts
   ◆ Knowledge base is designed and created
   ◆ Rule base is designed and created
   ◆ Inference engine is designed and created
   ◆ Input Screen is designed and created
   ◆ Output format is designed and created (4)

   After creating the Expert system testing and evaluation can be done as follows:
   Ailments with known diagnoses are used to test the system and results evaluated/does new system match original system specification/interviewing doctors about effectiveness of system (1)

   (b) Give two other examples of situations where expert systems might be used. [2]
   ◆ Car or machine engine fault diagnosis
   ◆ Prospecting for minerals or rocks
   ◆ Tax advisor
   ◆ Careers advisor
   ◆ Chess games
   ◆ Animal or plant classification and identification
12. The head teacher of a school wants to build an automated weather station. He has selected a group of pupils to be responsible for the weather station. The pupils want to use sensors connected to a computer to do this.

(a) Name three sensors that will be needed to measure the weather conditions. [3]
Temperature, Pressure, Moisture, Humidity, Light, Wind direction or speed

(b) Explain why computers are unable to read the data directly from these sensors. [2]
Sensor measures analogue data (1) and computer works with digital data (1)

(c) Describe three reasons why a computer would be used rather than relying on humans. [3]

- Computer can take readings during holidays/ readings can be taken any time of day or Night around 24/7 and do not take breaks
- Computer readings are more accurate than humans
- Readings can be taken more frequently and in shorter time intervals
- Can produce graphs/results more quickly because data already stored on computer
- Computer doesn’t forget to take readings

(d) When the results are produced they will be stored in a spreadsheet. The pupils want to produce a word processed report on the weather every month. Describe how the pupils will create their report using the spreadsheet results as well as a description of the weather. [5]

Steps like:
- Save spreadsheet in suitable format
- Create graphs
- Load/open word processing software
- Insert/spreadsheet/import spreadsheet/copy and paste spreadsheet/embed spreadsheet into document
- Insert/copy and paste graphs
- Type in/insert text
- Insert/import images
- Format images/charts
- Format reports/text

13. Tick three applications which use batch processing. [3]

<table>
<thead>
<tr>
<th>Application</th>
</tr>
</thead>
<tbody>
<tr>
<td>Producing utility bills.</td>
</tr>
<tr>
<td>Monitoring a patient’s condition in intensive care.</td>
</tr>
<tr>
<td>Inputting details of new stock into a library’s database.</td>
</tr>
<tr>
<td>Robotics on a car production line.</td>
</tr>
<tr>
<td>Controlling a greenhouse.</td>
</tr>
<tr>
<td>Reading data from bank cheques.</td>
</tr>
</tbody>
</table>

14. (a) Name the following networks.

- Ring network
- Star network

Prepared by Mrs. Magda M. Kamel & Eng. Gamal Orphy
M: 01001025852
(b) Give two advantages and two disadvantages of having computers networked. [4]

Advantages:
- Networked computers can share hardware
- Networked computers can share software
- Networked computers can share data/information
- Networked computers can use (Electronic) communication
- Users can be more effectively controlled and monitored

Disadvantages:
- Data can be misused more easily if there is no security software installed and increased security risk
- Viruses more easily spread over the networked computers
- Printer queues are built with many users sharing same printers
- Slower access to Internet when sharing a single connection service
- If server crashes all computers are affected

15 The manager of a supermarket uses a database to store data about the products she sells. This is part of the database.

<table>
<thead>
<tr>
<th>Bar code</th>
<th>Producer</th>
<th>Food type</th>
<th>Number in stock</th>
</tr>
</thead>
<tbody>
<tr>
<td>0049179000794 7</td>
<td>Herbot</td>
<td>Frozen Carrots</td>
<td>312</td>
</tr>
<tr>
<td>0027200190653 5</td>
<td>Caeser</td>
<td>Baking Powder</td>
<td>625</td>
</tr>
<tr>
<td>0010029000016 X</td>
<td>Brutus</td>
<td>Margarine</td>
<td>478</td>
</tr>
<tr>
<td>0014569021017 X</td>
<td>Malin</td>
<td>Garlic Paste</td>
<td>206</td>
</tr>
<tr>
<td>0010479001213 3</td>
<td>Holly</td>
<td>Chicken</td>
<td>513</td>
</tr>
</tbody>
</table>

(a) How many records are there in this part of the database? Five records [1]
(b) How many fields are there in this part of the database? Four fields [1]
(c) The records shown are to be sorted in descending order of number in stock. What will be the bar code of the first record in the database after it has been sorted? 0027200190653 5 [1]
(d) Give the name of a field that contains numeric data. Number in stock [1]
(e) Identity the field type of the Producer field. Alphabetic/Text/Alphanumeric [1]
(f) Which field would be the key field? Bar code [1]
(g) When goods are sold the database is automatically updated. Describe how this is done. [4]

Bar code is entered using a bar code reader and the bar code field in the data file is read record by record until a match is found with the bar code entered, the corresponding number in stock is read or found then quantity sold will be subtracted from this number and written back to file then number in stock checked with re-order quantity if less than or equal re-order quantity then flagged for reorder process
(h) When a customer pays for an item, chip and pin technology is used. Describe the steps involved in a customer transaction. [5]

Card details checked for validity and personal identification number (PIN) is entered and PIN is read from chip then two numbers are compared if identical transaction is authorised but if not identical transaction refused when it is authorised customer bank contacted by computer/automatically, a check if enough funds in account is done and if card invalid/insufficient funds then transaction is rejected but if card valid and sufficient funds available then transaction is authorised and money transferred from and deducted from customer account and credited to supermarket account.
(i) The supermarket owner wants to make the supermarket’s products available on-line. Name two pieces of data a customer would have to type in to gain access this system. [2]

User name/account number
Password/PIN

(j) To protect the customers’ data the owner will make sure the system uses encryption. Describe encryption. [3]

Encryption means converting data into unreadable form using a key needed to encrypt it so data is jumbled up/encoded and key must be known to decrypt it which prevents people from understanding data if they intercept or get hold of it.

(k) Describe the advantages and the disadvantages to the shops and the customer arising from shopping from home using the Internet. [8]

Customer – advantages
Less danger of robbery (mugging)
Don’t have to waste time travelling with long distances to shops
Elderly/Disabled people don’t have to travel to shop/leave home
Don’t have to spend money on travelling expenses travelling (long distances to shops)
Greater choice of goods
Can shop when shops are closed
Easier to search and find what you’re looking for

Customer – disadvantages
Lack of socialising/social contacts
Customers must have a computer/Internet access/(basic) computer skills
Hackers may intercept data and defraud customer
Deprived of personal touch
Phone bills can increase
Without broadband other family members cannot use the phone
Cannot see/feel goods in reality
More vulnerable to phishing
Goods sometimes don’t arrive/substitute goods may be sent/take longer to arrive
Must have a credit card
Shipping charges

Shop – advantages
Fewer staff needed/less spent on wages
Fewer shops needed/less spent on rates/rent
Less actual cash handled/fewer robberies
Less money spent on security staff
Potentially larger customer base

Shop – disadvantages
Initial outlay on computers is expensive
Need to retrain staff
Less customer loyalty/loss of customers due to lack of personal touch
Costs of system maintenance
Greater costs due to more delivery staff