

1 Tick (✓) **one** external device.

A sound card

☐

B pen drive

☒

C motherboard

☐

D ROM

☐

External devices are peripheral devices that are connected to a computer or other devices externally.

[1]

2 A computer system uses both analogue and digital data.

(a) Explain what is meant by these types of data.

(i) analogue data

Analogue data is physical data that changes smoothly from one value to the next. It is continuous data comprising of any values in a range. [1]

(ii) digital data

Digital data is data in discrete steps. It is in binary form. [1]

(b) Digital data is processed in a computer system. Sometimes digital data needs to be converted to analogue data.

Explain why digital data may need to be converted to analogue data.

Control systems - to control an external device
- to be sent to an actuator. [1]
An actuator is a mechanical or electromechanical device
e.g. relay, solenoid, motors etc

- (c) Use the most appropriate phrase from the list to complete the sentences. Your answer must be different in each case.

analogue data

digital data

display a graph on a monitor

input the maximum safe water level for a river

measure acidity levels in a river

control humidity levels

open the windows in a greenhouse

- (i) A motor is used to

open the windows in a greenhouse

[1]

- (ii) A DAC outputs

analogue data

[1]

- (iii) A sensor is used to

measure acidity levels in a river

[1]

- 3 Identify **three** different network communication devices and describe what each one does.

Device 1 Router

Description is a device that allows data packets from one network to another network based on IP addresses.

Device 2 Switch

Description a device that connects a number of devices together to form a LAN. It also allows data to be sent to individual devices.

Device 3 Bridge

Description Connects two LANs of the same protocol together.

Device 4: Hub

[6]

it expands a LAN; connects devices so data can be broadcast to all devices.

- 4 A teacher is creating a database for a class library. The teacher types the details of each book into the database. The teacher has entered a number of records.

Book_number	Name_of_book	Publisher	Date_acquired	ISBN
1101	Build a computer	JB Books	02/11/2020	9780119192065
1012	IT terms	MMA Books	16/05/2021	0893603944
1414	Databases are fun	Cam Press	01/10/2009	0090116393

Identify and describe a validation check based on the data shown in the database table, which could be applied to the data as it is entered into each of the fields. Each validation check must be different.

Book_number

Validation check... *Length check - each data item must be exactly 4 characters long*

Description... *- Character check - each data item must be an integer*
- Range check - data must be in the range 1000 to 9999/1999.
- Presence check - to check that the field has data, is not NULL

Date_acquired

Validation check... *Range check - checks that the date is between two dates.*

Description... *Format check - first two numbers followed by a slash then next two numbers followed by a slash then four numbers DD/MM/YY*

ISBN

Validation check... *Check digit - the number is checked by calculation of all the separate numbers.*

Description... *- Character check - data item must be an integer value.*

[6]

- 5 A group of pupils is planning to create a newsletter for a history project. The group can either use a smartphone or a phablet computer.

(a) Explain what is meant by a phablet computer.

A phablet is a hybrid device between a tablet and a smartphone. A tablet that functions as a smartphone. The device size is in between a smartphone and a tablet.

[2]

(b) Discuss the advantages and disadvantages of using a phablet computer rather than a smartphone for this project.

- Advantages**
- A phablet has a larger screen so it's easier to read the text/navigate/adit text/click on items
 - Better control over layout of the newsletter due to larger screen
 - Due to the large screen, more people can view at the same time
 - The onscreen keyboard is larger making it easier to enter the date
 - Easier to connect devices onto a phablet.
- Disadvantages**
- Less portable than a smartphone
 - More difficult to record audio messages due to screen size
 - Pupils are more likely to have smartphones than phablets.
 - If cameras are used then it is easier to use a camera with a smartphone than a phablet.

[6]

- 6 Many teachers use multimedia projectors in their lessons.

(a) State **two** health issues associated with the use of multimedia projectors.

- 1 Headaches may result from extended use without breaks.
- 2 Eye problems may arise in the long run due to extended use.
Burns may arise from intended fixing of broken parts.

[2]

(b) State **two** safety issues associated with the use of multimedia projectors.

- 1 Electrical fire due to overheating of the projector
- 2 Electrocution caused by liquid spilling on the projector
Tripping over cables
Projector falling on presenter

[2]

- 7 A video of a race can be recorded using a camera either on an autonomous flying vehicle (drone) or in a helicopter. A person would be needed in the helicopter to operate the camera.

Describe **two** advantages and **two** disadvantages of using an autonomous flying vehicle (drone) to record the video of the race.

Advantage 1 Cheaper to use a drone rather than a helicopter.

Easier to use drones than risking the humans filming in the helicopter

Advantage 2 The drone could fly closer to the competitors than a helicopter

Drones can be used in areas that would not be accessible by a helicopter

Disadvantage 1 More difficult to fix camera problems as no humans present

The range of the drone may be smaller

Disadvantage 2 The drone may fly out of control when out of range and loss of signal.

The drone may become a distraction as it is closer to the racers.

[4]

- 8 State the most appropriate storage medium from its description.

(a) A storage medium that stores data on the internet.

cloud storage - is data storage on remote servers accessible over the internet.

[1]

(b) Internal storage where the current instruction is stored.

Random Access Memory (RAM) - volatile memory

[1]

(c) A solid-state storage that is used in digital cameras.

Memory card
Flash memory

[1]

(d) An optical storage medium that stores high-definition (HD) movies.

Blu-ray disc

[1]

- 9 A hospital administrator enters data from medical forms into a database. Validation and verification are both used when entering data to minimise errors.

Explain what is meant by validation and verification and why they are both needed in this scenario.

Validation is an automatic computer check that ensures that the data entered is reasonable/sensible. It ensures data entered fits the criteria.

Verification checks that the data on the original source document is identical to the data that you have entered into a system.

Verification ensures that data is copied/entered correctly. Why they are needed:

- Data should be error free to ensure patients are safe.
- Because it is personal data that needs to be kept correct.
- If data is incorrect it could lead to fatal consequences.
- Individually, they cannot detect all errors.

[6]

- 10 The manager of the Tawara Hotel has decided to computerise the hotel's room booking system. The new booking system will allow customers to book rooms online using an app on their smartphones.

The manager has employed a systems analyst who will carry out research into the current system by examining existing documentation and completed questionnaires from staff.

- (a) One item of information that the systems analyst will need to identify is problems with the current system.

State **three** other items of information that the systems analyst will need to identify.

- 1 User requirements for the new system
 - 2 Inputs, processing and outputs of the current system
 - 3 Hardware and software requirements.
- Information requirements of the new system.

[3]

- (b) Following the analysis, the systems analyst will implement the new system using either parallel running or direct changeover.

Evaluate these different methods of implementation.

Parallel running

- Data would be entered twice which could cause double booking issues.
- Parallel running is more expensive to run/operate as there are two sets of staff/systems operating.
- In parallel, if the new system fails, the old system is still available.
- In parallel running, a system is always in place.

Direct Changeover

- Faster method of full implementation as the hotel will not want the system to be out of use.
- System is thoroughly tested before use therefore less chance of it being faulty.
- Staff have to be trained before the new system is implemented. This can be difficult as they are still working.
- Data can be lost as the old system has been removed.
- No system will be in place during the changeover.
- Training takes place on non-live systems which may mean problems can be missed.

[6]

- (c) Describe the benefits and drawbacks of using an online booking system.

Benefits

- Available 24/7 therefore helps customers to book at their convenience.
- Fewer problems with bookings/double bookings.
- Faster booking system as not waiting in queues.
- Immediate confirmation of the booking.
- Easier to cancel/change booking details.

Drawbacks

- Relies on telecommunications to make bookings.
- Needs an internet connection/access.
- Security issues may arise due to fraud.
- Wrong information may be added accidentally and this may be difficult to correct.

[5]

- (d) The hotel uses both a WAN and a WLAN.

Describe the differences between a WAN and a WLAN.

WAN is a Wide Area Network. It covers a large geographical area and tends to use satellite technology.
 WLAN is Wireless Local Area Network. It covers a small geographical area consisting of several buildings and connects devices wirelessly using wireless technology.
 Range of a WLAN: 10m - 100meters
 Range of a WAN: 10 km and over.

[4]

- 11 A clothing retailer only sells its clothes on the internet.

- (a) Discuss the benefits and drawbacks to the clothing retailer of using internet shopping.

Benefits:

- Saves the cost of having a store
- Saves on cost of rent/insurance
- Saves on cost of staff as less staff is required
- Larger customer base thus increases profits.
- The selling is not limited to shop opening hours thus increasing sales.

Drawbacks:

- Reliant on technology
- Operates 24/7 thus increasing overheads.
- Relies on customers that only shop online.
- Needs large warehouse space/distribution space
- Increased cost as more staff will be needed to operate / develop the website
- Relies on customers that only shop online

[6]

- (b) A customer is purchasing some new clothes from this retailer.

Describe the steps the customer would take when purchasing the new clothes using internet shopping.

The customer loads the website by typing in the URL.
The customer then sets up an account, verifies it and logs in on entering their username and password.
The customer browses the online catalogue, clicks on items required, enters the quantity/colors/size of items.
Adds the items to the virtual cart, clicks on the checkout button and chooses payment method.
Picks the delivery location and method and adds payment/delivery/personal details. Customer rechecks information entered and logs out of system on submission of request. [5]

- 12 The manager of a sports club is designing an online form for members to enter their personal details. The form must be accessible to all members of the club.

- (a) State four characteristics of a good form design.

- 1 - Easy data entry
 - Language use is simple to understand
- 2 - Font size is large enough to read
 - Clear and visible labels for each field
- 3 - Appropriate data entry sections size of fields
 - Use of suitable error messages
- 4 - Use of navigation buttons
 - Good use of white space

[4]

- (b) State **two** characteristics of good form design that would help users with visual impairment to enter their data.

- Use of high contrast colours
 - Use of voice entry
 - Use of text to speech
 - Buttons are large enough to see
 - Font size is large enough to see/read
- [2]

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