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**QUESTION ONE**

1. **Define input devices**

Refers to piece of equipment used to provide data and control signals to an information processing system for instance keyboard, mouse and scanners.

1. **Using suitable examples explain the following categories of input devices**
2. **Discrete input devices**

Devices that sends signals that are either on or off for example light switch, push buttons and proximity switches. They only report only to two states including on and off, open or close.

1. **Continuous input devices**

Devices that sends continuous or analogue signals. Analogue signals are continuous and can have any number of states not just two for example a temperature transducer where it sends a continuous stream of temperature data to a PLC.

Temperature data is expressed in varying degrees not hot and cold.

**QUESTION TWO**

**(a) Giving examples explain the following types of pointing devices**

**(i) Direct pointing devices**

This is an input interface, specifically a human interface, that allows a user to input data directly to a computer.

Examples include touchscreens, pen system. The tablet or a graphics table incorporates an LCD into the digitizing tablet itself, allowing the user to draw directly on the display surface.

Fingers manipulate visual objects directly on the screen.

**(ii) Indirect pointing devices**

The position of the cursor is controlled by a device. It is not at the same physical position as the pointer but translates its movements onto screen for example mouse and joystick.

1. **What factors should be considered for choosing the most appropriate pointing devices**
2. *User Needs*

This is urgency of use of the device in the computer room by users also whether it will satisfy the needs of the user. Also how easy to learn does the device needs to be to the users. How manually dexterous the user is should be considered.

1. *Costs*

The amount it can cost when purchasing the device and also the amount that can be used to maintain the servicing of the device should be considered.

1. *Amount of space it occupies.*

The size of the room to be used in setting the computer room and the devices should be considered if its adequate.

1. *Compatibility with available hardware.*

Will the devices fit with the other devices in the room already?

1. *User Friendliness*

This is whether the devices will be used to solve problems and easy to be used by the users.

**QUESTION THREE**

1. **What is an output device**

This is piece of computer hardware equipment which converts information into a human readable form that can be in the form of text, graphics, tactile, audio and video.

It retrieves data from a computer system and further translates the received data into a form understandable by humans.

1. **Identify and explain the different types of output devices**
2. *Output Display Devices*

These are devices that allow a user to see what is happening on a computer in the form of text, graphics and video.

Monitors are the mostly general type of output display devices which include monitors and screen projectors.

1. *Audio Output Devices*

Refers to devices that play both internal and external speakers which may be ported via a 3.5mm headphone jack. The audio output device not only produce clear sound but also sound such as music and soundtrack.

1. *Physical Output Devices*

These make something solid for example a printer. These can be 2D printers, they reproduce text or words on a piece of paper.

They can also create 3D print outputs, creating complete objects.

**QUESTION FOUR**

1. **Describe two usability issues that need to be considered in designing a keyboard or keypad which is integral to a mobile device (that is, the keyboard cannot be separated from the rest of the device). In each case justify your answer.**
2. *What size the keys need to be?*

Keyboards are available with every size of key from the huge keys down to the tiny keys used to achieve functionality with maximum portability on mobile devices.

1. *How robust the keyboard should be?*

In difficult environments, such as factories, ordinary keyboards can clog up with dirty and liquids. Membrane keyboards solve this problem as they are sealed. Unfortunately, they are flat, so they do not provide the same tactile and audio output.

1. **Describe two possible ways (output) in which an aircraft cockpit system might signal that the aircraft is flying at an unsafe speed for the current flying conditions**
2. *Flashing Lights*

Lights often indicate whether a product is on or off. On aircraft they are required to attract attention of other aircraft pilots so they will know to keep a safe distance.

The lights are powerful to shine through fog or thick clouds in bad weather.

1. *Loud Alarms*

These are used to attract the attention of the pilot of the unsafe speed so as to give the pilot cautious.

**QUESTION FIVE**

1. **Name two input devices that cannot be used effectively by blind people, and explain why.**

Blind people cannot use any form of pointing device, so joysticks, mouse, touchscreen are inaccessible. This is because the user cannot perceive the effect of moving the mouse because of the (typically) exclusive (completely) visual feedback.

However, keyboards and keypads are both usually very effective input devices for the blind people. Keyboards have raised keys to indicate whether the user is on the keyboard and the user can they touch and type.

1. **Describe two ways of making computer output accessible to visually impaired people**
2. *Magnification of some or all of the screen* – This helps people with some but limited sight for example who are extremely short sighted.
3. *Changing colours of backgrounds and* *text* – This can help ensure the text stands out, making it easier to read.
4. *Speech output* – Most visually impaired people can still hear the audio rather it can be a good output accessible way.
5. **Approximately 1 in 10 men are red/green colour blind; describe one way in which the design of an interactive product can take into account colour blindness.**

Avoiding using red or green together rather one can use additional coding device such as font, typeface and underline.

**QUESTION SIX**

**A tourist information centre wants to design a system to provide information about accommodation and events in the town. This information will be used by visitors of all ages. It will be located in the wall outside the tourist information centre so that it can be accessed from the pavement when the centre is shut.**

**Consider the merits of each of the following pointing devices as a means of interacting with this system:**

1. **Touch screen**

* It is easy to learn using the touch screen
* The user attitude is favourable
* Touch screens are robust

1. **Trackball**

* They are robust
* They occupy a little space

1. **Mouse**

* They are widely used
* They are more accurate than touch screens and trackballs.