

Exemplar Revision Booklet: Principles of Design Engineering

Materials and Components

Explain two reasons why a designer may choose a thermoplastic for a handheld device.

- Thermoplastics can be remoulded, making prototyping easier.
- They offer good impact resistance, protecting internal components.

Describe one advantage and one disadvantage of using a thermoset for an electrical product casing.

Advantage: High heat resistance improves safety.

Disadvantage: Cannot be recycled once set.

Mechanisms and Motion

Describe a mechanism that converts rotary motion to oscillating motion.

A cam and follower can convert continuous rotary input into an oscillating output as the follower rises and falls.

Explain why linkages are used in small consumer products.

They allow compact motion transfer and can multiply force within limited space.

Electronics and Power

A circuit draws 0.2 A from a 5 V supply. Calculate its power.

$$P = IV = 0.2 \times 5 = 1 \text{ W.}$$

Explain why efficiency is important in battery-powered products.

Increased efficiency extends battery life and reduces heat generation, improving safety and performance.