

Design & Technology

Modern materials

Materials required for questions

- Pencil
- Rubber
- Calculator

Instructions

- Use black ink or ball-point pen
- Try to answer all questions
- Use the space provided to answer questions
- Calculators can be used if necessary
- For the multiple choice questions, circle your answer

Advice

- Marks for each question are in brackets
- Read each question fully
- Don't spend too much time on one question

Good luck!

Q1. What is not a use for thermo-ceramics?

- A** Turbine blades
- B** Metal cutting tools
- C** F1 car break discs

Q2. What is **not** a disadvantage of using an LCD screen over traditional screens?

- A** LCD is more expensive
- B** LCDs are very fragile
- C** LCDs have a shorter lifespan

Q3. Having smartphone screens that repel greasy fingerprints is achieved using which of the following?

- A** Polymorph
- B** Nanomaterials
- C** LCDs

Q4. What is a modern material **(1 marks)**

[illegible]

Explain three advantages of thermo-ceramics that make them appropriate in these situations **(6 marks)**

2.

3.

Answers

Q1. B

Q2. C

Q3. B

Q4.

- A modern material is a material that has been engineered to have improved properties (1)

Q5.

Advantages

- Low energy requirement/efficient (1)
- Extends battery life (1)
- Lightweight units (1)
- Thin / small / compact unit / minimal space required (1)
- Increased portability (1)
- Produce a wide range / 256 colours (1)
- Vivid / bright / clear display (1)
- Small pixel size allows detailed/ sharp/ high quality / high-definition images (1)
- Sufficiently robust /tough /can take some impacts / knocks (1)
- Reliable/ durable / long-lasting (1)
- Can be mass produced cheaply / quickly (1)
- They do not get hot (1)
- Light is instant/no warm-up time (1)
- Reduced eye strain (1)
- Powered by small batteries (1)

Disadvantages

- Can be broken from a direct impact / relatively easily (1)
- Limited viewing angle (1)
- Expensive to replace / high maintenance cost / difficult to fix (1)
- Can suffer from image persistence / retention (1)
- A small, damaged area can affect the whole screen (1)

Q6.

- Strength (1) in order to withstand high forces without breaking / deforming (1)
- Heat resistant (1) so they do not soften / weaken when in situ (1)
- Stable (1) so that they do not excessively expand with heat causing malfunction (1)
- Hard (1) so that they do not wear away /scratch when in use (1)
- Lightweight (1) increasing efficiency (e.g., fuel saving) (1)