DTBase©

Design & Technology
AQA GCSE

Modern materials

Materials required for questions

- Pencil
- Rubber
- Calculator

Instructions

- Use black ink or ball-point pen
- Try 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
- Try to answer every question
- Don’t spend too much time on one question

Good luck!

Q1. Titanium is preferred over steel in aerospace applications because:

A It is heavier for better stability

B It has a higher strength-to-weight ratio

C It is more flammable

Q2. Why are metal foams valuable in automotive design?

A They absorb impact energy while being lightweight

B They conduct electricity better than copper

C They change colour under stress

Q3. LCDs use liquid crystals because they:

A Emit light spontaneously

B Change alignment under electric fields to control light

C Generate heat for displays

Q4. Nanomaterials in medicine are used for:

A Targeted drug delivery

B Making pills taste better

C Reducing production costs

Q5a. Name one specific modern material **(1 mark)**

Q5b. Explain why the use of modern materials improves the function of products **(2 marks)**

Answers

Q1. B
Q2. A
Q3. B
Q4. A

Q5a.
Accept

- Carbon Fibre
- Corn starch Polymers
- D30
- Flexible MDF
- Gore-Tex®
- Graphene
- Kevlar
- Liquid Crystal displays (LCDs)
- Metal Foams
- Nano materials
- Titanium
- Nitinol/SMA
- Thermochromic pigments
- Photochromic pigments
- Quantum Tunnelling Composite QTC
- Polymorph
- Semi-precious clays

Don't accept

- Memory Foam (generic)
- Nylon
- Plywood

Q5b.
The guidance provided is illustrative and not exhaustive.

- A range of materials specifically developed to meet specific product requirements, eg Pyrex® for heat resistance = 2
- Improved materials with enhanced properties not available in traditional materials, eg wood, metal = 2
- Improved durability of products in working conditions, eg heat, stress etc = 2

- Longer lasting products = 1
- Easy to work with = 0