**Design & Technology**

**AQA GCSE** Logo

Description automatically generated with low confidence

**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