

Write your name here

Surname

Other names

Pearson
Edexcel GCE

Centre Number

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Candidate Number

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Design and Technology

Product Design: Resistant Materials Technology

Advanced Subsidiary

Unit 2: Design and Technology in Practice

Monday 22 May 2017 – Morning

Time: 1 hour 30 minutes

Paper Reference

6RM02/01

You do not need any other materials.

Total Marks

Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and candidate number.
- Answer **all** questions.
- Answer the questions in the spaces provided
– *there may be more space than you need.*

Information

- The total mark for this paper is 70.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*
- Questions labelled with an **asterisk** (*) are ones where the quality of your written communication will be assessed
– *you should take particular care on these questions with your spelling, punctuation and grammar, as well as the clarity of expression.*

Advice

- Read each question carefully before you start to answer it.
- Try to answer every question.
- Check your answers if you have time at the end.

Turn over ►

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Pearson

Answer ALL the questions. Write your answers in the spaces provided.

1 Figure 1 shows two views of a set of vacuum formed yoghurt pots.

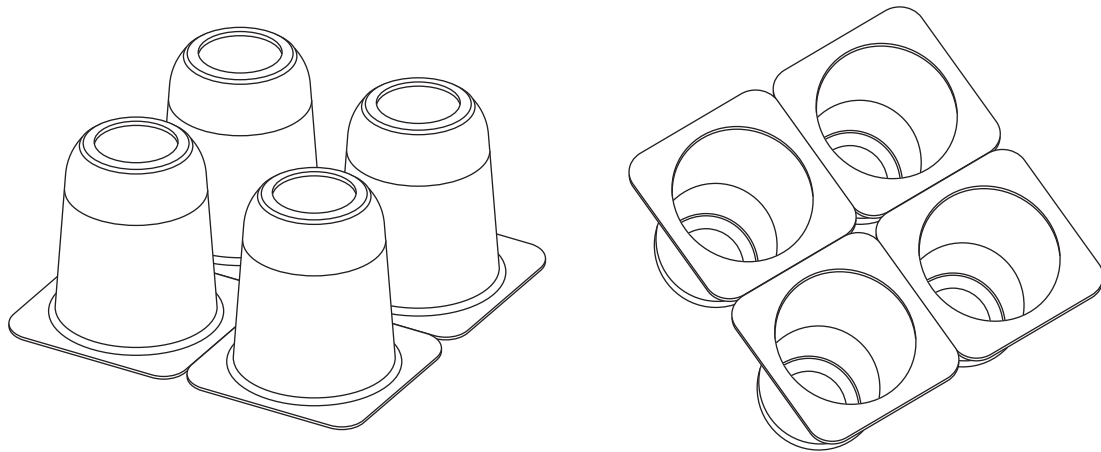


Figure 1

(a) Name a suitable polymer for vacuum forming the yoghurt pots shown in figure 1.

(1)

(b) Outline **four** features of the yoghurt pot shape shown in figure 1 that make it suitable for the vacuum forming process.

(4)

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(c) The vacuum forming process uses a polymer sheet, a heater and a mould.

Describe, using notes and/or sketches, the vacuum forming process.

(6)

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(Total for Question 1 = 11 marks)



2 Figure 2 shows a table made from medium density fibreboard (MDF) that has been painted.



Figure 2

(a) Explain **three** advantages, other than cost, of manufacturing the table from MDF rather than pine.

(6)

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(b) The paint used when manufacturing the table is subject to the Control of Substances Hazardous to Health (COSHH) regulations.

Give **five** issues, apart from safe storage, that need to be considered under COSHH regulations regarding the use of the paint.

(5)

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(Total for Question 2 = 11 marks)



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3 (a) Computer-aided design (CAD) systems are now used extensively during the design of products in preference to manual drawing methods.

One disadvantage of CAD systems is their initial cost.

Outline **three** further disadvantages of CAD systems when designing products.

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(b) Figure 3 shows a steel component manufactured on a computer numerically controlled (CNC) machine.



Figure 3

(i) State which CNC machining process is most suitable for manufacturing the component shown in figure 3.

(1)

(ii) After manufacture, the component in figure 3 would undergo a range of quality control tests to identify possible faults.

Outline **three** manufacturing faults that may have occurred during the machining of the component.

(3)

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(iii) Justify **three** ways a business can reduce the cost of testing whilst maintaining effective quality control systems.

(6)

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(Total for Question 3 = 13 marks)

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*4 (a) Figure 4 shows an external screw thread cut on the end of a piece of steel rod.



Figure 4

Describe the process of manually cutting the external screw thread on the steel rod.

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(b) Pop rivets are used to join sheet metal together and require holes to be drilled prior to fitting.

Describe, using notes and/or sketches, the process of pop riveting. Your answer should show clearly how the pop rivet holds the pieces of sheet metal together.

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(Total for Question 4 = 11 marks)



5 Figure 5 shows a small electric motor with a plain brass bearing.

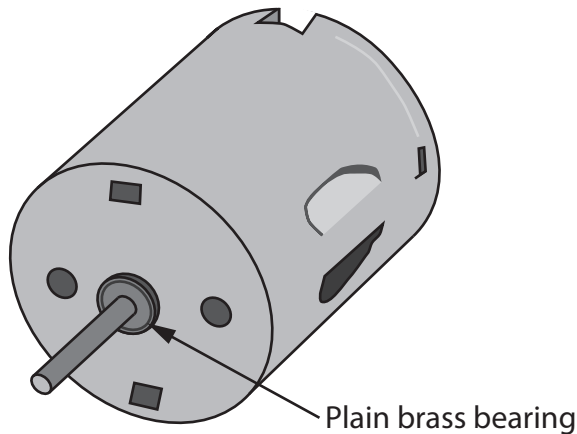


Figure 5

(a) Explain **three** reasons, apart from strength, why brass is used for the plain bearing.

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(b) Some motors are fitted with ball bearings rather than plain bearings.

Explain **three** disadvantages of ball bearings over plain bearings.

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(Total for Question 5 = 12 marks)

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- 6 (a) Figure 6 shows a coat sleeve with integrated media player controls. The controls use quantum tunnelling composite (QTC) to operate a media player.

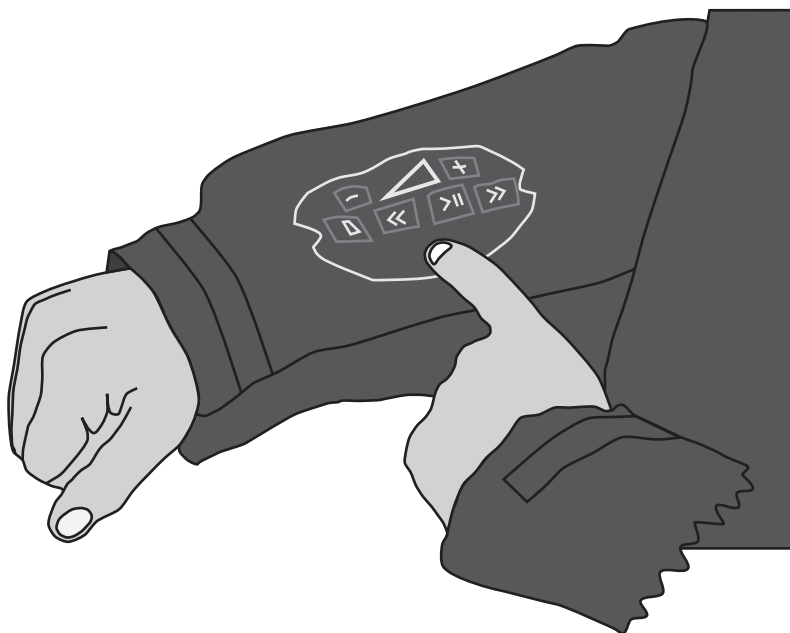


Figure 6

Outline the reasons why QTC is a suitable material for wearable controls.

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*(b) Figure 7 shows a solar panel charger connected to a mobile phone.

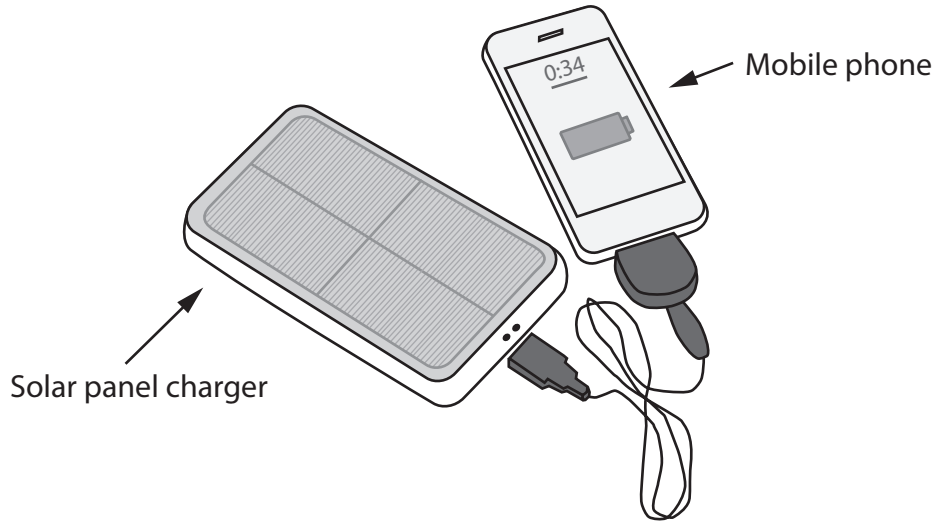


Figure 7

Evaluate the use of a solar panel charger to recharge a mobile phone.

(8)

Area with horizontal dotted lines for writing the evaluation.



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(Total for Question 6 = 12 marks)

TOTAL FOR PAPER = 70 MARKS

