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Pearson BTEC Level 1/Level 2 First Award	Centre Number <table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> </tr> </table>									Learner Registration Number <table border="1" style="width: 100%; height: 20px; border-collapse: collapse;"> <tr> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> <td style="width: 12.5%;"></td> </tr> </table>								

Engineering

Unit 38: Materials Used in Engineered Products

Friday 25 May 2018 – Morning Time: 1 hour	Paper Reference 20573G
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You do not need any other materials.	Total Marks
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Instructions

- Use **black** ink or ball-point pen.
- **Fill in the boxes** at the top of this page with your name, centre number and learner registration 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 50.
- The marks for **each** question are shown in brackets
– *use this as a guide as to how much time to spend on each question.*

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

Some questions must be answered with a cross . If you change your mind about an answer, put a line through the box and then mark your new answer with a cross .

1 The materials used in engineered products are chosen because of their specific properties or characteristics.

(a) Identify **one** example of an alloy.

(1)

- A Zinc
- B Tin
- C Bronze
- D Acrylic

(b) Identify **two** examples of polymer materials.

(2)

- A Thermosetting
- B Magnesium
- C Brass
- D Elastomer
- E Bronze

(c) Give **two** characteristics of composite materials.

(2)

1

2

(d) Name the physical property of a material that determines how much visible light it lets through.

(1)

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(Total for Question 1 = 6 marks)

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2 (a) These **two** products are produced by different engineering sectors using a range of materials.

Draw **one** straight line from each product to the engineering sector that has produced it.

(2)

Product

Engineering Sector



© iStock Getty ImagesPlus

Television



© iStock Getty ImagesPlus

Smartphone

Chemical

Electrical

Nuclear

Communications

Automotive



P 5 3 3 0 7 A 0 3 1 6

(b) Identify **two** examples of physical material properties.

(2)

- A** Grain structure
- B** Crystal lattice
- C** Melting point
- D** Tensile strength
- E** Thermal conductivity

(c) Engineering materials can be supplied in different form types.

Give **two** advantages of having metal form types supplied as a casting.

(2)

1

2

(d) Name **one** stage in the life cycle of a material.

(1)

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(Total for Question 2 = 7 marks)

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3 (a) Identify **one** example of a surface treatment.

(1)

- A Plating
- B Milling
- C Forging
- D Hardening

(b) Name **two** material properties that are defined as chemical and durability.

(2)

1

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2

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(Total for Question 3 = 3 marks)

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4 6NG Engineering produces components that are used in the manufacture of small boats.

(a) Name the engineering sector that manufactures boats.

(1)

(b) These component parts of boats are made from different materials.

Draw **one** straight line from each component to the material it is most likely to be made from.

(2)

Component

Material



© JackF/Getty Images

Propeller



© iStock Getty ImagesPlus

Sonar mast

Aluminium

Silver

Glass fibre

Rubber

Shape memory polymer

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(c) The hulls of small boats are manufactured from ferrous metals.



© FooTTooGettyImages

State **two** advantages of applying a paint finish to the hull.

(2)

1

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2

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(Total for Question 4 = 5 marks)



5 NN20 Engineering manufactures a range of engineered products, including transmission masts and landing gear components.



Tower supports

© paule858GettyImages

(a) State **two** reasons why a pipe/tube form of supply is suitable for use in transmission masts.

(2)

1

2

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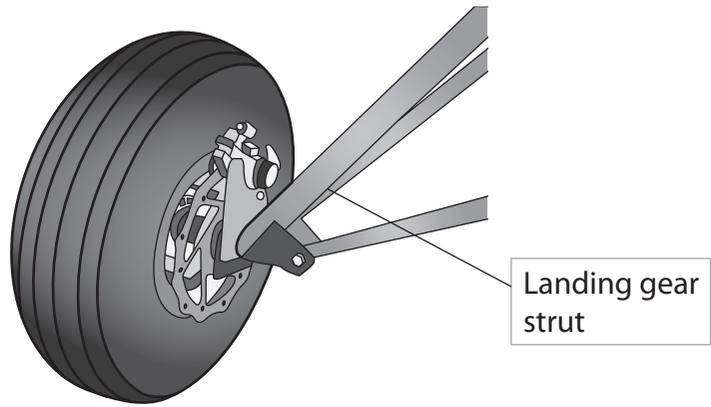
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(b) NN20 Engineering manufactures landing gear struts using composite materials.



Explain **two** disadvantages of using composite materials in this situation.

(4)

1

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(Total for Question 5 = 6 marks)



P 5 3 3 0 7 A 0 9 1 6

6 SK9 Engineering manufactures sports cars using a wide range of metals, polymers and smart materials.

(a) The image shows an example of a form of supply used for metals.

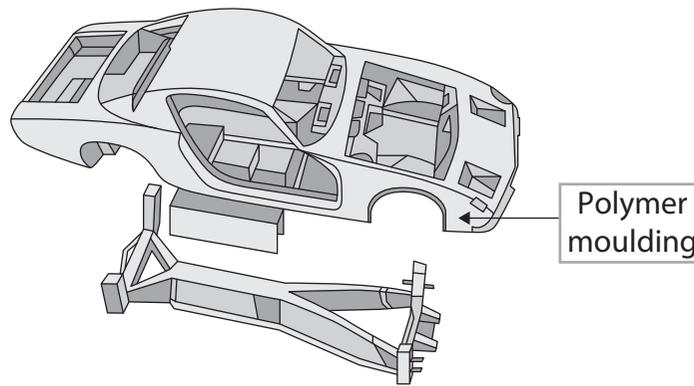


© codyGetty Images

Identify the form of supply shown.

(1)

(b) SK9 Engineering uses polymer mouldings in the production of sports cars.



Explain **one** advantage for SK9 Engineering of using polymers in the production of sports cars.

(2)



(c) SK9 Engineering uses smart materials in the suspension parts for sports cars.



© Maksim ToomeShutterstock

Explain **two** advantages of using electro-rheostatic fluids in suspension parts of cars.

(4)

1

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2

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(Total for Question 6 = 7 marks)



P 5 3 3 0 7 A 0 1 1 1 6

7 L10 Aeroengineering manufactures large components for multinational companies in the aerospace sector, using a range of metallic and composite materials.

(a) L10 Aeroengineering produces jet engine parts using stainless steel.

Explain **one** reason why stainless steel is a suitable material in this situation.

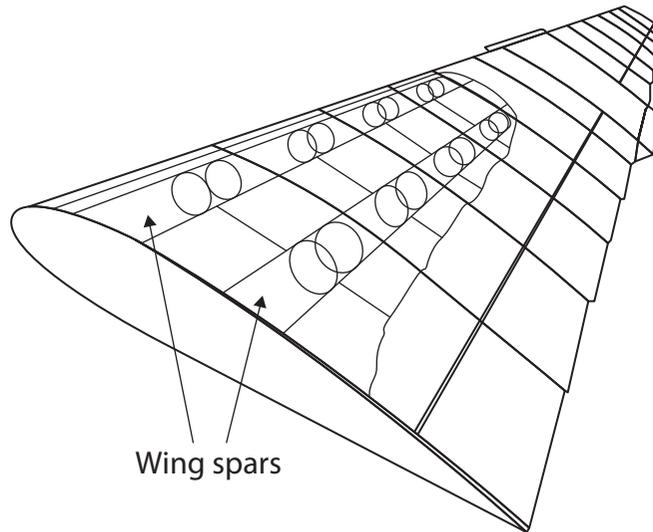
(2)

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(b) L10 Aeroengineering manufactures wing spars for aircraft using a range of materials and processes.



(i) Explain **one** advantage of using aramid fibres for wing spars.

(2)

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(ii) The wing spars can be manufactured from duralumin.

Explain **two** advantages of annealing the wing spars.

(4)

1

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2

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(Total for Question 7 = 8 marks)

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- 8 3JS Engineering manufactures games consoles. The company wants to investigate the reuse of components in the manufacture of new games consoles.



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Evaluate the reuse of components in new games consoles.

(8)

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(Total for Question 8 = 8 marks)

(TOTAL FOR PAPER = 50 MARKS)



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