

Retired Onscreen Test Version 1 Unit 1: The Engineered World

BTEC Firsts Level 1/2 in Engineering

This retired onscreen test has been made available to centres to help you prepare your learners for their BTEC Firsts Level 1/2 external assessments.

We recommend that you use this test as a written assessment which is then either teacher marked or peer assessed.

This retired test should be used in conjunction with the Mark Scheme and the Lead Examiner's Report to clearly identify the assessment requirements. These documents are available at:

<http://www.edexcel.com/quals/firsts2012/engineering/Pages/default.aspx>

Retired Test Development



We are currently working towards a simulation test where mock onscreen tests can be taken in a real environment. However as this is being developed, we have temporarily created these PowerPoint based tests to support you.

How can I view the videos in the test?

This document has been produced using screen captures of the retired onscreen test. As such, videos are not available in this PowerPoint document. This document should be used in conjunction with the retired onscreen test which is available on the website:

<http://www.edexcel.com/quals/firsts2012/engineering/Pages/default.aspx>

How can I see the drop down menus in the test?

Where a drop down menu may obscure information the learner requires to answer a question, we have instead supplied a text box containing the options from the drop down menu. To view drop down menus please use the retired onscreen test.

Question 1/19

The image shows a graphics card used in a computer.

Which **two** engineering processes would be used to make the graphics card? (2)

Click on the **two** correct processes.

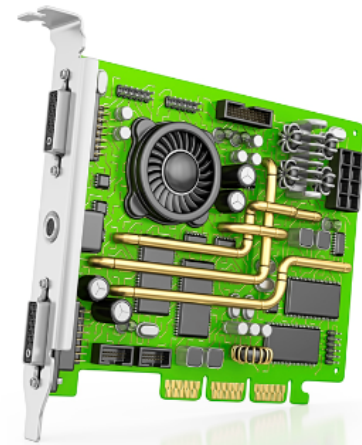
Forging

PCB manufacture

Milling

Shearing

Surface mount technology



Question 2/19

Different engineering sectors produce different products.

Match the **two** products to the most appropriate engineering sector. (2)

Click on each product and then the correct engineering sector.

Product

Plastic bottle



Satellite receiver



Engineering sector

Aerospace

Automotive

Communications

Biomedical

Chemical

Question 3/19

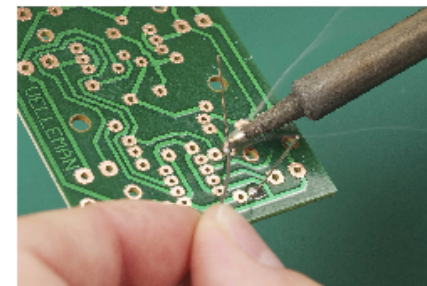
The image shows a person using a soldering iron.

(a) Give **two** safety precautions that you should follow when using a soldering iron. (2)

Type your answers in the boxes.

(b) Give **one** disadvantage of using the soldering process when modelling circuits. (1)

Type your answer in the box.



Question 4/19

One-off/jobbing production techniques are sometimes used when making engineered products.

Identify **two** reasons why one-off/jobbing production techniques are used. (2)

Click on the **two** correct reasons.

Because robots can complete repetitive operations

To produce a unique product

Because product demand is low


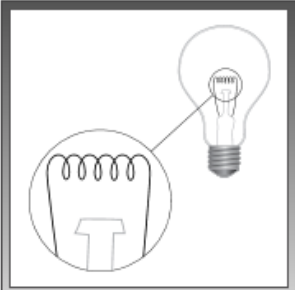
To make use of low skilled labour

To allow for continuous processing

Question 5/19

Match the **two** products to the most appropriate material used to make them. (2)

Click on each product and then the correct material.

	Product	Material
Spectacles frame		<input type="button" value="Titanium"/>
Light bulb filament		<input type="button" value="Shape memory polymer"/>
		<input type="button" value="Electrochromic"/>
		<input type="button" value="Tungsten"/>
		<input type="button" value="Kevlar"/>

Question 6/19



Metal Inert Gas (MIG) welding is an engineering process that can be used to join metal.

Explain **one** reason for using a MIG welding process to join metal. (2)

Type your answer in the box.

Question 7/19



Robots have many engineering applications.

(a) Give **two** advantages of using a robot in a nuclear waste processing environment. (2)

Type your answers in the boxes.

(b) Give **one** disadvantage of using an assembly robot in a low volume motorsport production cell. (1)

Type your answer in the box.

Question 8/19



Superalloys and cubic boron nitride are modern high performance materials.
Superalloys are often machined with a cubic boron nitride cutting tool.

Give **two** properties of cubic boron nitride that make it a suitable material for machining superalloys. (2)

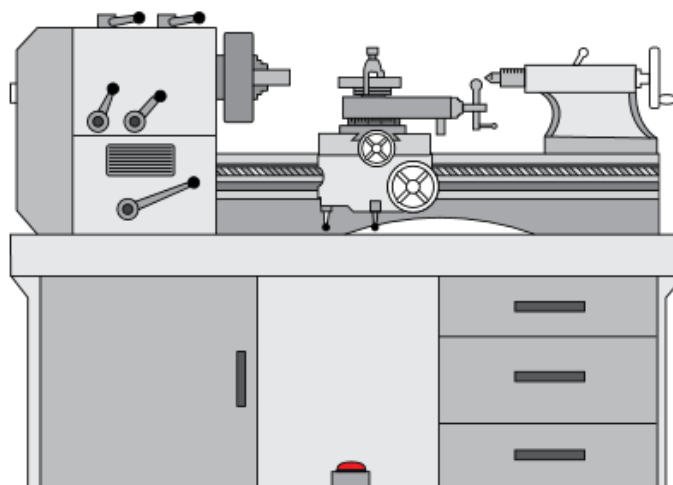
Type your answers in the boxes.

Question 9/19

The diagram shows a centre lathe.

(a) Identify the **carriage** on the diagram of the centre lathe. (1)

Click on the part of the diagram that shows the **carriage**.



(b) Where would the workpiece be gripped? (1)

Click on **one** of the boxes.



Tailstock



Chuck



Lead screw



Tool post

Question 10/19



Hydro energy is a renewable source of energy used to generate electricity.
Hydro energy is generated from a free resource.

Explain **one** other advantage and **one** disadvantage of using hydro energy as a renewable energy source.

(4)

Type your answers in the boxes.

Advantage

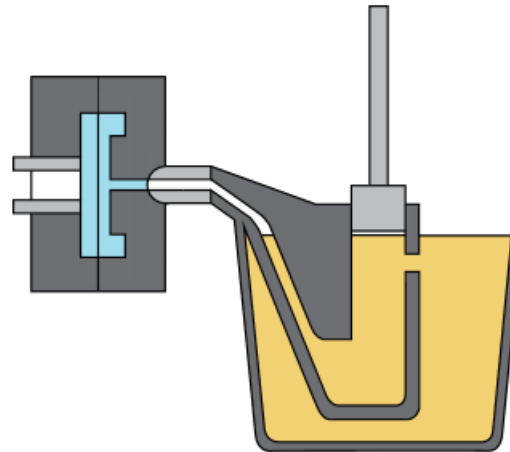
Disadvantage

Question 11/19

Engineers use different casting processes to manufacture different products.
The diagram shows the die casting process.

(a) Identify the **die** on the diagram of the die casting process. (1)

Click on the part of the diagram that shows the **die**.



(b) Complete the statement about the die casting process. (1)

Select the correct word from the drop down menu to complete the sentence.

Aluminium is an ideal metal to use for die casting because of its low point.

Melting
Boiling
Yield
Fracture

Question 12/19

Powder metallurgy is a four-stage modern manufacturing process used in engineering.

What is the **first** stage of the powder metallurgy process? (1)

Click on **one** of the boxes.

☐

Powder blending

☐

Compacting

☐

Powder manufacture

☐

Sintering

Question 13/19



Complete the statement about fibre optic cables. (1)

Select the correct word from the drop down menu to complete the sentence.

Optical fibres can transmit data using as a transmission medium.

- Sound
- Light
- Vibration
- Resistance

Question 14/19



Products such as circuit boards are often collected for recycling.

Explain **one** advantage and **one** disadvantage for a manufacturer of making its products recyclable. (4)

Type your answers in the boxes.

Advantage

Disadvantage

Question 15/19



Smart materials have specific advantages when used in engineering.

Complete the sentences about the advantages of smart materials. (2)

Select the correct word from the drop down menu to complete the sentence.

A shape memory polymer can go back to its original shape when is applied.

Heat
Light
Colour
Pressure

have the ability to generate charge when squeezed.

Piezoelectric Transducers
Shape Memory Alloys
Superalloys
Electrochromatic devices

Question 16/19

You are a manufacturing engineer working for an automotive windscreen manufacturer.
You need to reply to this text message.



Explain **one** advantage of using surface nanotechnology for this application. (2)

Type your answer in the box.

Question 17/19

The image shows an aeroplane with a blended wing body.

Explain **two** advantages of aeroplanes having blended wing bodies. (4)

Type your answer in the box.

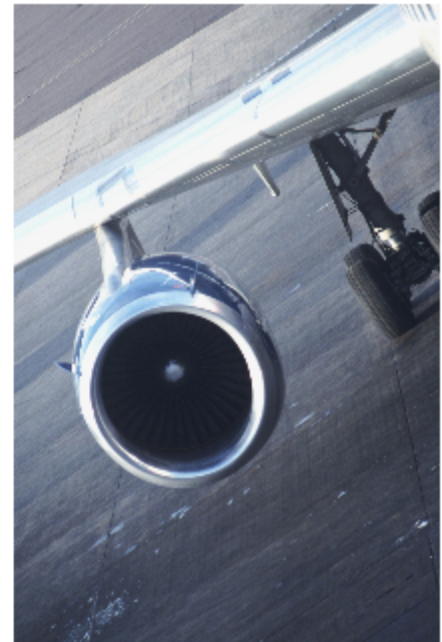


Question 18/19

The image shows an aircraft engine assembly.
Metallic foam is used in an aircraft engine assembly because it is a lightweight material.

Explain **one** other advantage of using metallic foam in an aircraft engine assembly. (2)

Type your answer in the box.



Question 19/19



Electrobox Engineering is a company that manufactures electrical switch panels for commercial properties. The company currently has individual employees assembling a complete electrical switch panel. To do this, the employees must:

- collect all of the required parts for one electrical switch panel from the storage area
- assemble the switch panel at their workbench
- carry the panel to the finished goods area.

Evaluate Kaizen as an approach for minimising waste when assembling an electrical switch panel at Electrobox Engineering. (8)

Type your answer in the box.