

Retired Onscreen Test Version 5 Unit 1: The Engineered World

BTEC Firsts Level 1/2 in Engineering

Introduction



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://qualifications.pearson.com/en/qualifications/btec-firsts/engineering-2012-nqf.coursematerials.html#filterQuery=Pearson-UK:Category%2FExternal-assessments>

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://qualifications.pearson.com/en/qualifications/btec-firsts/engineering-2012-nqf.coursematerials.html#filterQuery=Pearson-UK:Category%2FExternal-assessments>

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 crankshaft used in a diesel engine.

(a) Which engineering process would be used to make the crankshaft? (1)

Click on **one** of the boxes.

PCB Manufacture

Welding

Riveting

Forging



(b) Which engineering sector would produce fuel for the diesel engine? (1)

Click on **one** of the boxes.

Automotive

Marine

Chemical

Communications

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

Cardiac pacemaker



Helicopter rotor blade



Engineering sector

Chemical

Automotive

Communications

Biomedical

Aerospace

Question 3/19

The image shows an industrial robot.
Industrial robots can be used for a variety of modern production applications.

(a) State **two** types of engineering operation that can be carried out using this type of industrial robot. (2)

Type your answers in the boxes.

(b) Give **one** disadvantage of using this type of industrial robot when making small batches of products. (1)

Type your answer in the box.



Question 4/19

Different engineering sectors produce different products.

(a) Which of these products is from the communications sector? (1)

Click on the correct image.



Smartphone



Suspension bridge



Jet fighter



Steel washer

(b) Complete the sentence about a pocket calculator. (1)

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

A pocket calculator is a product from the sector.

- mechanical
- electrical/electronic
- chemical/polymer
- automotive

Question 5/19

Piezoelectric transducers are often used for engineering applications.

Which **two** of these engineering applications use piezoelectric transducers? (2)

Click on the **two** correct applications.

Heat treatment

Ultrasonic testing

Hardness testing

Surface treatment

Force measurement

Question 6/19

The image shows a dental implant with a titanium post.

Explain **one** advantage of using titanium for dental implants. (2)

Type your answer in the box.



Question 7/19

The image shows a machined part from a hydraulic flow control valve.
Most of the part has been made on a lathe, using turning techniques.

(a) Give **two** advantages of using turning techniques to make the machined part. (2)

Type your answers in the boxes.



(b) Give **one** reason why a cutting fluid would be used when turning the machined part on a lathe. (1)

Type your answer in the box.

Question 8/19

The image shows a mask that should be used when carrying out most welding operations.

Explain **one** reason for using this type of mask when carrying out welding operations. (2)

Type your answer in the box.



Question 9/19

Powder metallurgy is a modern material process used in engineering.

Identify **two** characteristics of the powder metallurgy process. (2)

Click on the **two** correct characteristics.

High tolerances can be specified

Small amounts of energy used

Little waste material is produced

Large components can be produced

Ductile components can be produced

Question 10/19

The image shows the turbine blades from a jet engine.
Jet engine turbine blades are often made from superalloys.

Explain **two** reasons why superalloys are used to make jet engine turbine blades. (4)

Type your answer in the box.



Question 11/19



Modern composite materials are used in a variety of engineering applications.

Complete the sentences about modern composite materials. (2)

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

Kevlar reduces when used in mountain bike tyres.

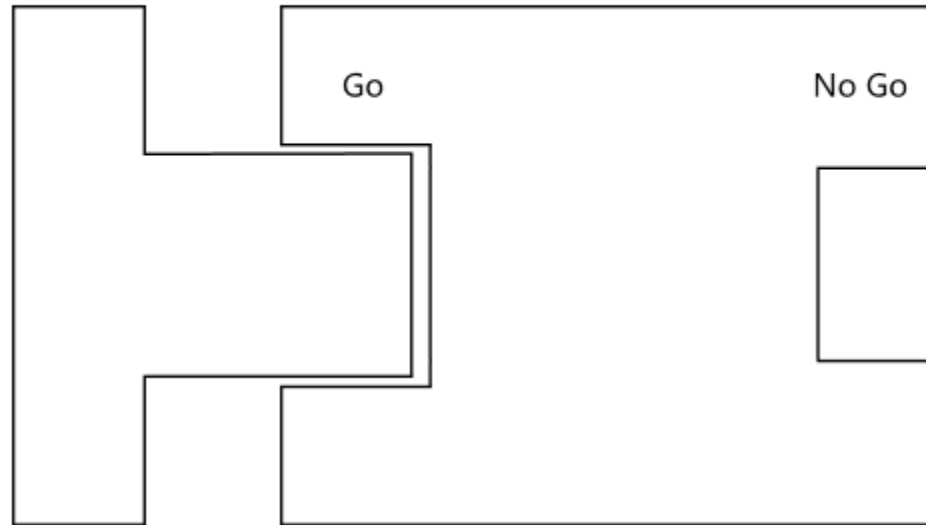
pressure
skidding
punctures
sensitivity

Carbon fibre is used in aerospace applications because of its superior strength to ratio.

weight
shear
tension
sound

Question 12/19

The image shows a Go/No Go gauge.



A Go/No Go gauge is an example of which lean manufacturing technique? (1)

Click on **one** of the boxes.

JIT

Poka-yoke

Kaizen

Kanban

Question 13/19

Manufacturers use different scales of production when manufacturing products. The video shows the production of blank DVDs.



The video shows an automated process where the machine is moving DVDs in-between different parts of the manufacturing process.

Which scale of production would be used to manufacture the blank DVDs? (1)

Click on **one** of the boxes.

One-off production

Jobbing production

Continuous production

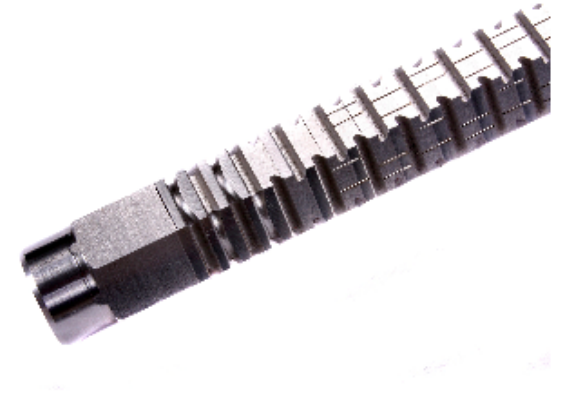
Cellular production

Question 14/19

The image shows an industrial shaft made by ZYX Engineering.
After the forging process, the shaft has undergone further processing.

Explain **two** ways in which ZYX Engineering can make its engineering processes more energy efficient when producing the industrial shaft. (4)

Type your answer in the box.



Question 15/19

The images show a range of methods that can be used to collect energy from renewable sources.

Which **two** images show a method of collecting solar energy? (2)

Click on the correct images.



PV panels



Wind farm



Geothermal plant



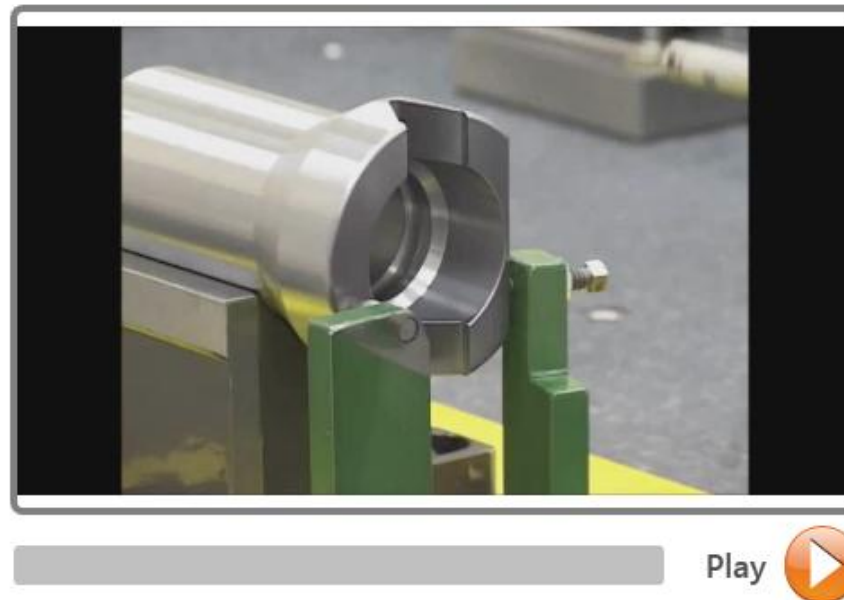
Water heater



River dam

Question 16/19

CNC techniques can be used for measuring machined components.
The video shows a CNC measuring device checking the sizes of a finished part.



The video shows an automated probe entering the screen and measuring the component that has been produced

Explain **one** advantage of using a CNC measuring device to check the size of finished parts. (2)

Type your answer in the box.

Question 17/19



A range of welding processes is available to engineers.
One of these is the Tungsten Inert Gas (TIG) welding process.

Explain **two** disadvantages of using TIG welding as a joining process. (4)

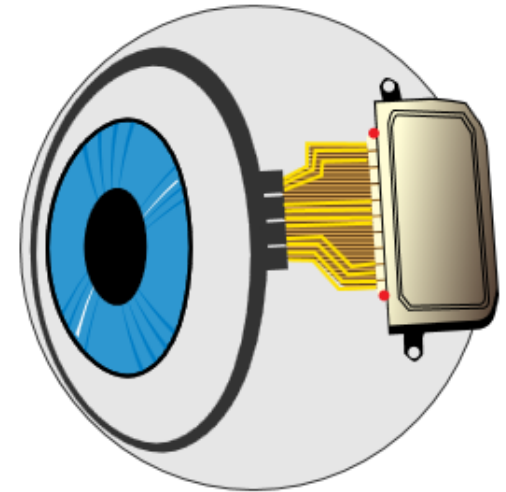
Type your answer in the box.

Question 18/19

The image shows a bionic eye.
Bionic eyes are used to help people see.

Explain **one** other way bionic eyes can be used. (2)

Type your answer in the box.



Question 19/19



Sunnydays Engineering is a specialist company manufacturing a photovoltaic (PV) panel for energy generation. The company is expanding and is considering the sustainability of its PV panel. It has completed a Life Cycle Assessment (LCA) for its product.

Evaluate the possible outcomes of the LCA for the PV panel manufactured by Sunnydays Engineering. (8)

Type your answer in the box.