OCR

Wednesday 4 June 2014 – Afternoon

GCSE ENGINEERING

A624/02 Impact of Modern Technologies on Engineering

Candidates answer on the Question Paper.

OCR supplied materials:
None

Other materials required:
None

Duration: 1 hour

Candidate forename		Candidate surname	

Centre number						Candidate number				

INSTRUCTIONS TO CANDIDATES

- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting your answer.
- Write your answer to each question in the space provided. Additional paper may be used if necessary but you must clearly show your candidate number, centre number and question number(s).
- Do **not** write in the bar codes.

INFORMATION FOR CANDIDATES

- The number of marks is given in brackets **[ ]** at the end of each question or part question.
- The total number of marks for this paper is **60**.
- Your Quality of Written Communication will be assessed in questions marked with an asterisk (*).
- This document consists of **12** pages. Any blank pages are indicated.

1 Engineering sectors produce different products.

(a) Name **three** engineering sectors and, for each one, give **one** example of a product made in the sector.

Sector .....

Product .....

Sector .....

Product .....

Sector .....

Product .....

[6]

(b) Choose **one** of the products you have given in part **(a)** and describe how modern technology is used in its manufacture.

Product .....

.....

.....

..... **[2]**

2 The list below shows different types of engineering materials.

Alloy	**Ferrous metal**
Ceramic	**Non-ferrous metal**
Composite	**Polymer**

(a) Complete the table by giving one example of each type of engineering material. One has been done for you.

Type of engineering material	Example
Alloy	Bronze
Ceramic	
Composite	
Ferrous metal	
Non-ferrous metal	
Polymer	

[5]

(b) Place a tick (✓) in one of the boxes below to show the type of engineering material most suitable for injection moulding.

Alloy ☐ **Ceramic** ☐ **Polymer** ☐ **Composite** ☐

[1]

3 Different types of engineering components are listed below.

Mechanical
Electrical/electronic
Pneumatic/hydraulic

(a) Complete the table by giving examples of each type of engineering component. One example has been done for you.

Type of engineering component	Example 1	Example 2
Mechanical	Gears	
Electrical/electronic		
Pneumatic/hydraulic		

[5]

(b) Explain why manufacturers of engineered products often use 'bought-in' standard components.

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.....

.....

..... **[3]**

4 Fig. 1 shows an aluminium alloy crank on a bicycle.

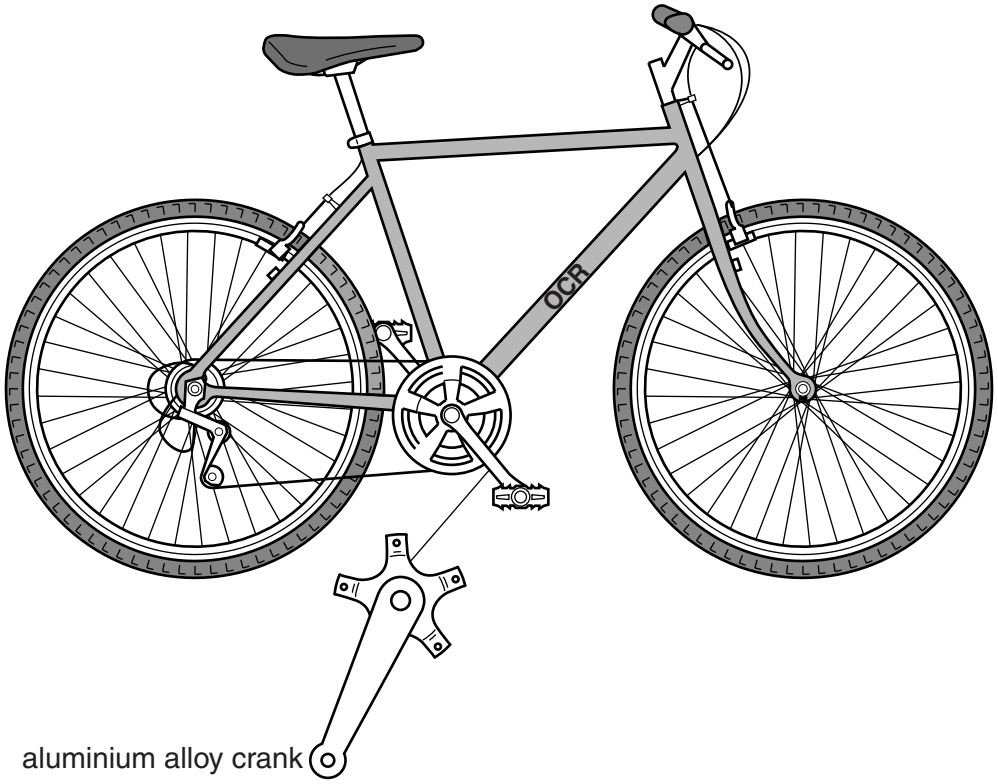

Fig. 1

(a) (i) Give **two** reasons why aluminium alloy is a suitable material for the crank shown in Fig. 1.

1 .....

2 .....

[2]

(ii) Describe **one** engineering process that could be used to make the crank in large quantities.

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[3]

(b) Describe **one** safety precaution that should be taken when carrying out a heat and/or chemical treatment process.

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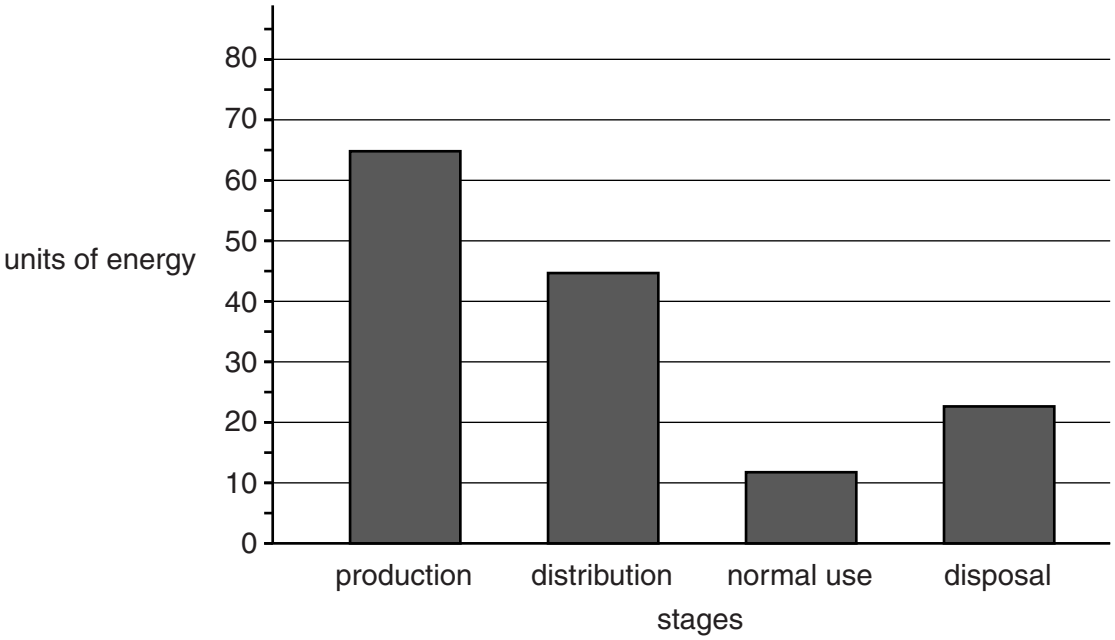
..... **[2]**

5 The chart below shows the energy used at stages in the life of an engineered product.



(a) State which stage uses the least energy.

..... **[1]**

(b) Give **two** possible reasons why production of the product uses so much energy.

1 .....

.....

2 .....

.....

[4]

(c) Describe how energy is used in the disposal of an engineered product.

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..... **[3]**

6 **(a)** Complete the table below by giving examples of each type of engineering process. One example has been done for you.

Type of engineering process	Example 1	Example 2
Material removal	Drilling	
Shaping and manipulation		
Joining and assembly		
Surface finishing		

[7]

(b) Choose **one** of the examples from part **(a)** and give **two** safety precautions, other than PPE (Personal Protective Equipment), that must be taken.

Example chosen .....

Safety precautions:

1 .....

2 .....

[2]

7 **(a)** **(i)** One example of modern technology is the use of PLCs in the manufacture of engineered products.

State what the letters PLC stand for.

P …… **L** …… **C** …… **[1]**

(ii) Describe, giving **one** example, how a PLC might be used in the manufacture of an engineered product.

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..... **[3]**

(b) Describe **two** uses of information, communications and digital technologies in 'material supply and control'.

1 .....

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2 .....

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[4]

8* Discuss the advantages and disadvantages of using modern technologies in communication.

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..... **[6]**

END OF QUESTION PAPER

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