

**Thursday 31 January 2013 – 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	
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Centre number						Candidate number				
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**INSTRUCTIONS TO CANDIDATES**

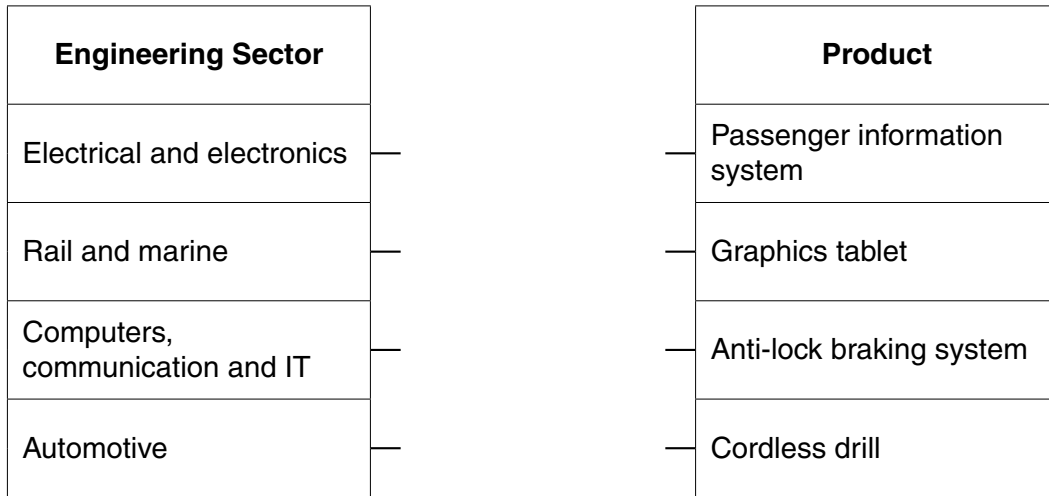
- Write your name, centre number and candidate number in the boxes above. Please write clearly and in capital letters.
- Use black ink. HB pencil may be used for graphs and diagrams only.
- Answer **all** the questions.
- Read each question carefully. Make sure you know what you have to do before starting 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) Complete the links below to identify which engineering sector makes the products listed.



[4]

(b) Choose **two** products from those listed above and, for each one, give **one** example of a modern technology used in the product.

Product .....

Modern technology ..... [1]

Product .....

Modern technology ..... [1]

(c) Name **two** engineering sectors different to the ones shown in part (a).

1 .....

2 .....

[2]

2 A list of engineering materials is given below.

- |                  |               |                        |
|------------------|---------------|------------------------|
| <b>ABS</b>       | <b>bronze</b> | <b>polycarbonate</b>   |
| <b>aluminium</b> | <b>HIPS</b>   | <b>stainless steel</b> |
| <b>brass</b>     | <b>MDF</b>    | <b>zinc</b>            |

(a) (i) Give **two** materials from the list that are alloys.

1 .....

2 ..... [2]

(ii) Give **two** materials from the list that are polymers.

1 .....

2 ..... [2]

(b) Explain, using **one** example, why a plastics material might be preferred to a metal.

.....

.....

.....

..... [3]

3 The list below gives a number of engineering processes.

- |                  |                           |                       |
|------------------|---------------------------|-----------------------|
| <b>boring</b>    | <b>forging</b>            | <b>soldering</b>      |
| <b>brazing</b>   | <b>glueing</b>            | <b>threading</b>      |
| <b>casting</b>   | <b>injection moulding</b> | <b>turning</b>        |
| <b>drilling</b>  | <b>milling</b>            | <b>vacuum forming</b> |
| <b>extrusion</b> | <b>sawing</b>             | <b>welding</b>        |

(a) Engineering processes perform different tasks.

Complete the table below by giving **two** processes that perform the given tasks. Processes must be chosen from the list.

<b>Performed Tasks</b>	<b>Process 1</b>	<b>Process 2</b>
Material removal		
Shaping and manipulation		
Joining and assembly		

[6]

(b) Select **one** process you have given in part (a) and give **two** safety precautions that should be taken when carrying out the process.

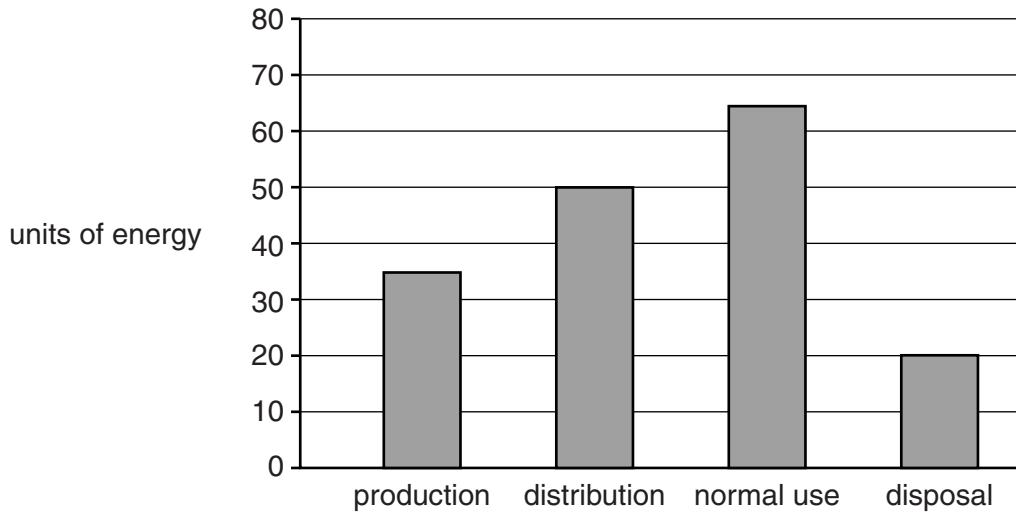
Process .....

1 .....

2 .....

[2]

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



(a) (i) State the number of units of energy used in the production stage.  
..... [1]

(ii) State which stage uses the smallest amount of energy.  
..... [1]

(iii) Explain **one** possible reason for the large amount of energy used in the distribution stage.  
.....  
.....  
.....  
..... [3]

(b) Describe the effects of the end-of-life disposal of engineered products on the environment.  
.....  
.....  
.....  
..... [3]

5 Fig. 1 shows a number of engineering components used in control systems.

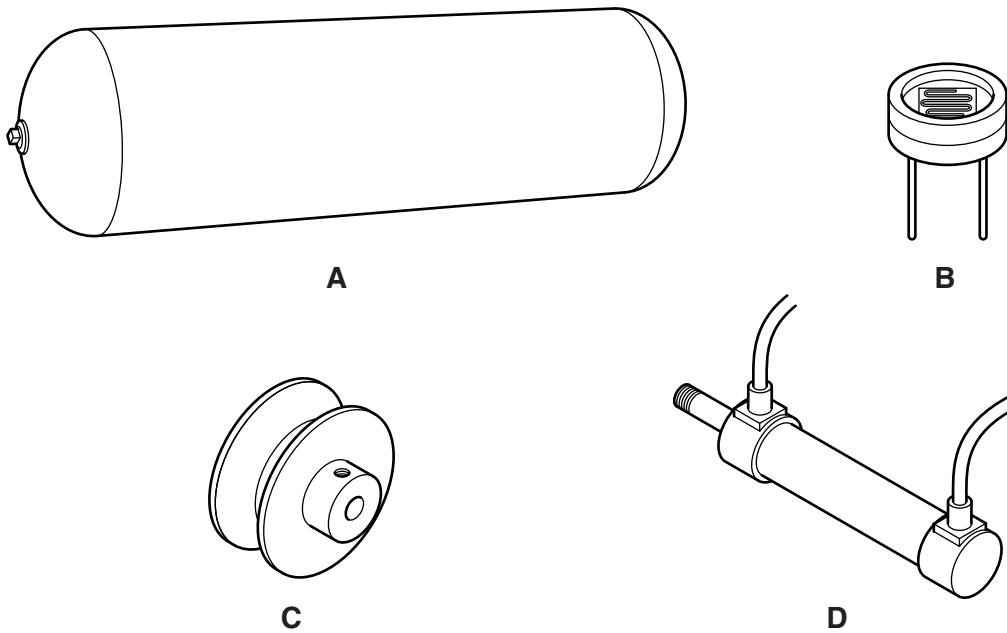


Fig. 1

(a) Complete the table below by giving the name of each component and indicating which type of engineering component it is. The first one has been done for you.

Component	Name	Type of Engineering Component		
		Mechanical	Electrical / Electronic	Pneumatic / Hydraulic
A	Air receiver			✓
B				
C				
D				

[6]

(b) State which of the components shown in Fig. 1 could be described as a 'sensor'.

..... [1]

(c) Select **one** of the components shown in Fig. 1 and, using **one** example, describe its function in detail.

Component .....

Function .....

.....

.....

..... [3]

6 Computer Aided Design (CAD) and Computer Aided Manufacture (CAM) are widely used by engineering companies.

(a) Give **two** benefits of using CAD to produce engineering drawings.

1 .....

.....

2 .....

.....

[2]

(b) Name **two** computer controlled machines used in the manufacture of engineered products.

1 .....

2 .....

[2]

(c) Explain how CAD/CAM could be used in the development of a new engineered product.

.....

.....

.....

.....

[3]



7 Stages in the manufacture of engineered products are given below.

- material supply and control**
- processing and production**
- assembly and finishing**
- packaging and dispatch**

Select **two** of the stages and, for each one, explain how modern technologies might be used.

1 Stage .....

Use of modern technologies

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

2 Stage .....

Use of modern technologies

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



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