

OCR

Oxford Cambridge and RSA

Monday 1 June 2015 – 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 A list of engineering sectors is given below.

Aerospace
Automotive
Chemical and Process
Computers, Communication and IT

Electrical and Electronics
Medical and Pharmaceutical
Rail and Marine
Structural and Civil

(a) Complete the table below by stating which engineering sector from the list makes the products given.

Product	Sector
Washing machine	
Emulsion paint	
Mobile phone	
Wheelchair	
Disc brake	

[5]

(b) Choose **one** of the products from the table above.
 Describe the use of a modern technology in the product.

Product

.....

.....

.....

..... [2]

2 A list of engineering materials is given below.

- | | |
|---------------------|-------------------------|
| ABS | Copper |
| Aluminium | HIPS |
| Bronze | High speed steel |
| Carbon fibre | Mild steel |
| Cast iron | Nylon |

(a) Choose materials from the list to complete the following statements.

- (i) **Two** examples of alloys are and [2]
- (ii) **Two** examples of polymers are and [2]
- (iii) An example of a composite material is [1]

(b) Describe what is meant by the term 'non-ferrous metal' and give **one** example.

.....

.....

..... [2]

- 3 Fig. 1 shows a mounting panel for control switches on a machine. The mounting panel is made from 3 mm thick aluminium alloy.

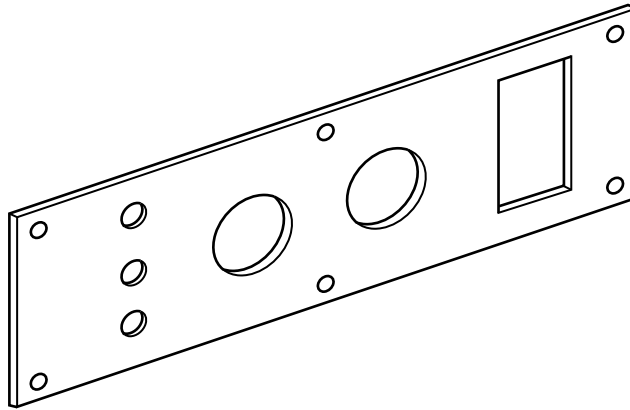


Fig. 1

- (a) (i) Give **two** suitable finishes for the aluminium alloy mounting panel.

1

2

[2]

- (ii) Give **two** safety precautions, other than using Personal Protective Equipment (PPE), that must be taken when carrying out a surface finishing process.

1

2

[2]

- (b) (i) The mounting panel shown in Fig. 1 is produced on a laser cutting machine. Explain why laser cutting would be used instead of conventional presswork.

.....

.....

.....

..... [3]

- (ii) Tick (✓) one of the boxes below to show which type of process laser cutting is.

Material removal

Shaping and manipulation

Joining and assembly

Heat and chemical treatment

[1]

4 Fig. 2 shows a number of engineering components.

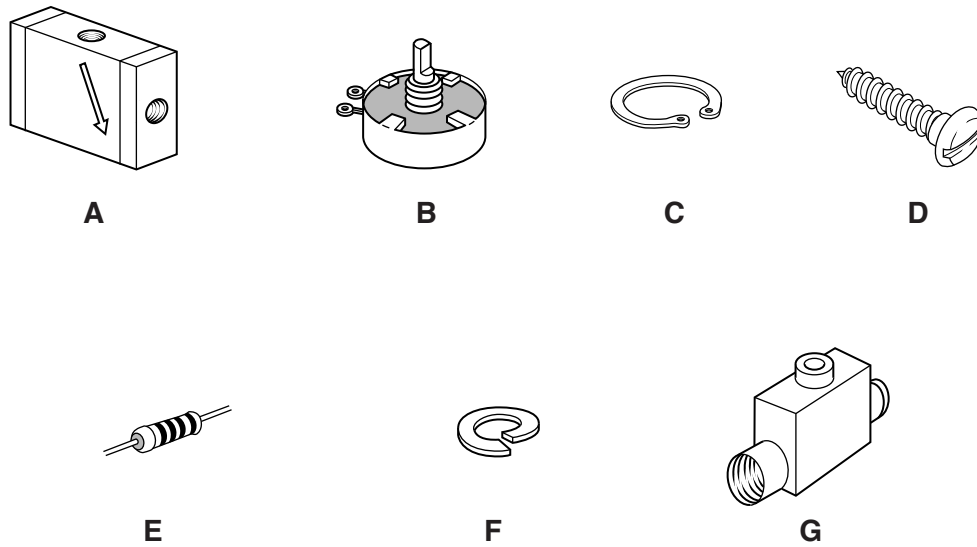


Fig. 2

There are three types of engineering components:

- Mechanical
- Electrical/electronic
- Pneumatic/hydraulic

(a) Choose **three** components from Fig. 2. Complete the table below by giving the name and type of each component. One has been done for you.

Component	Name of component	Type of component
F	Spring washer	Mechanical

[6]

(b) Explain what is meant by the term 'pre-manufactured components' and give **one** example.

.....

.....

.....

..... [3]

- 5 Fig. 3 shows a charging station for a cordless telephone. The charging station is mass produced in a plastics material.

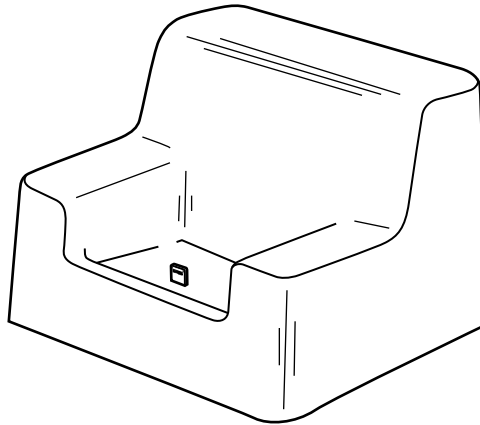


Fig. 3

- (a) Name **one** specific plastics material that would be suitable for producing the charging station.

..... [1]

- (b) State which industrial process would be used to mass produce the charging station.

..... [1]

- (c) The charging station was designed using Computer Aided Design (CAD) software.

Give **three** benefits to a designer of using CAD software when designing new products.

1

.....

2

.....

3

.....

[3]

(d) Describe how modern technologies could be used to produce a prototype of the charging station shown in Fig. 3.

.....

.....

.....

..... [3]

Turn over for the next question.

6 Risk assessment is an important part of health and safety procedure.

(a) Explain what is meant by the term 'risk assessment'.

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

(b) Describe **one** benefit to a manufacturer of following health and safety procedures.

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

(c) Using **one** example other than safety, explain how modern technologies have helped improve working conditions in engineering factories.

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

7 Modern technologies are used in many different areas of engineering, including:

- Research
- Materials
- Automation
- Systems and control

(a) Choose **two** areas from the list. Describe **one** use of modern technology in each area.

1 Area

Use of modern technology

.....

.....

..... [2]

2 Area

Use of modern technology

.....

.....

..... [2]

(b) Explain how information, communications and digital technologies might be used when developing new products and give **one** example.

.....

.....

.....

..... [3]

8* Discuss the benefits to the environment of recycling engineered products.

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

.....

..... [6]

END OF QUESTION PAPER

11
BLANK PAGE

PLEASE DO NOT WRITE ON THIS PAGE

PLEASE DO NOT WRITE ON THIS PAGE



Copyright Information

OCR is committed to seeking permission to reproduce all third-party content that it uses in its assessment materials. OCR has attempted to identify and contact all copyright holders whose work is used in this paper. To avoid the issue of disclosure of answer-related information to candidates, all copyright acknowledgements are reproduced in the OCR Copyright Acknowledgements Booklet. This is produced for each series of examinations and is freely available to download from our public website (www.ocr.org.uk) after the live examination series.

If OCR has unwittingly failed to correctly acknowledge or clear any third-party content in this assessment material, OCR will be happy to correct its mistake at the earliest possible opportunity.

For queries or further information please contact the Copyright Team, First Floor, 9 Hills Road, Cambridge CB2 1GE.

OCR is part of the Cambridge Assessment Group; Cambridge Assessment is the brand name of University of Cambridge Local Examinations Syndicate (UCLES), which is itself a department of the University of Cambridge.