

OCR

Oxford Cambridge and RSA

Monday 1 June 2015 – Afternoon**GCSE ENGINEERING****A624/02** Impact of Modern Technologies on Engineering

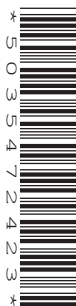
Candidates answer on the Question Paper.

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.

2

- 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]

4

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

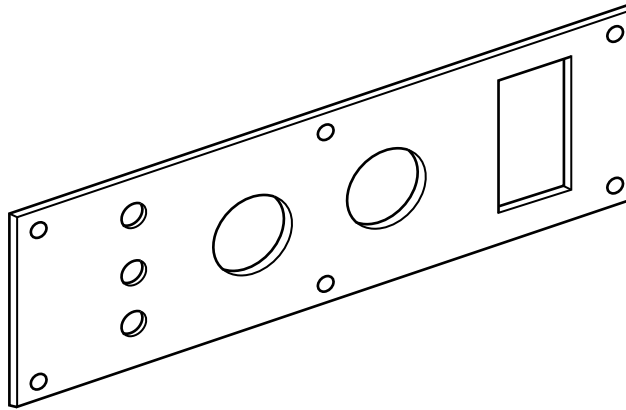


Fig. 1

- (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
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

[1]

5

4 Fig. 2 shows a number of engineering components.

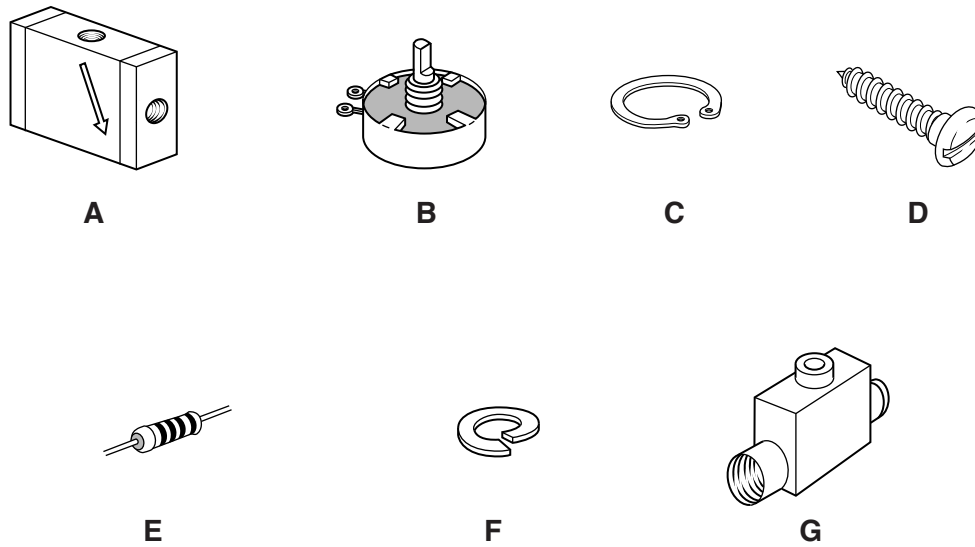


Fig. 2

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.

.....

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.....

..... [3]

6

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

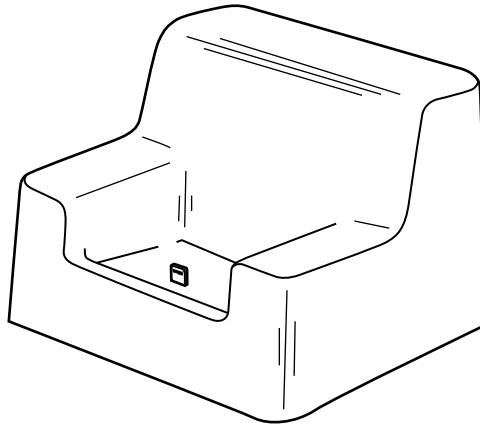


Fig. 3

- (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]

7

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

.....

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..... [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'.

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.....

..... [3]

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

.....

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..... [2]

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

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.....

..... [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.

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..... [3]

10

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

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..... [6]

END OF QUESTION PAPER

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