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RECOGNISING ACHIEVEMENT

GENERAL CERTIFICATE OF SECONDARY EDUCATION

ENGINEERING

A624

Impact of Modern Technologies on Engineering

A622680611

Candidates answer on the question paper.

OCR supplied materials:
None

Other materials required:
None

Friday 20 May 2011
Morning

Duration: 1 hour

A624

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. Pencil may be used for graphs and diagrams only.
- 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).
- Answer **all** the questions.
- 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 is assessed in questions marked with an asterisk (*****).
- This document consists of **12** pages. Any blank pages are indicated.

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1 Engineering sectors produce different products.

(a) Complete the links below to identify which engineering sector makes the products listed.

Engineering Sector	Product
Aerospace	Hearing aid
Medical and Pharmaceutical	Inertia seat belt
Electrical & Electronic	Aircraft wing
Automotive	Hard disc drive
Chemical and Process	TV remote control
Computers, Communications and IT	Toothpaste

[6]

(b) Select **three** engineering sectors from the list above.
Give **one** different product made in that sector.

1 Sector .....

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

2 Sector .....

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

3 Sector .....

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

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2 The introduction of modern technologies has resulted in a number of benefits to society.

(a) Describe **two** benefits that the use of modern technology has had on the availability of products.

1 .....

.....

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

2 .....

.....

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

(b) Describe, using **two examples**, how modern technology has made modern products safer to use.

1 .....

.....

2 .....

.....

..... **[4]**

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3 **(a)** State what the letters **CAD** stand for in the context of engineering.

C ..... **A** ..... **D** ..... **[1]**

(b) Orthographic projection is one type of engineering drawing.
Name **two** other types of engineering drawings.

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

2 ..... **[1]**

(c) Completed CAD drawings are saved as computer files.

(i) State **one** electronic method of sharing a CAD file with an engineering company.

.....

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

(ii) Describe how the method you have identified in **(i)** would be used.

.....

.....

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

(iii) Describe how a back-up copy of a CAD file could be made.

.....

.....

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

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4 Engineered products normally go through the following stages of production.

assembly
heat treatment
shaping

(a) (i) State **two** activities that could be carried out on an engineered product at the shaping stage.

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

2 ..... **[1]**

(ii) State **two** different activities that could be carried out on an engineered product at the assembly stage.

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

2 ..... **[1]**

(iii) State **two** different activities that could be carried out on an engineered product at the heat treatment stage.

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

2 ..... **[1]**

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5 Programmable Logic Controllers (PLCs) are used in the production of some engineered products.

(a) Describe **two** benefits of using PLCs in the production of engineered products.

1 .....

.....

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

2 .....

.....

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

(b) Explain how PLCs can be used in the packaging and dispatch of completed engineered products.

.....

.....

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

(c) Give **two** further examples of a production process where PLCs are used.

Example 1 .....

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

Example 2 .....

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

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6 Describe **one** different quality control check that should be used for each of the following engineering processes.

(i) Turning .....

.....

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

(ii) Soldering .....

.....

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

(iii) Surface finishing .....

.....

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

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7 Engineering components are normally classified as:

electrical / electronic
mechanical
pneumatic / hydraulic

(a) Select **four** of the engineering components listed below and place them in the correct position in the table.
Two have been done for you.

resistor	**flow control valve**	**reservoir**
pump	**diode**	**set screw**
spring	**transistor**	**cam**

Electrical / Electronic	Mechanical
Transistor	**Spring**

[2]

[2]

(b) Smart materials are often found in engineered products.

(i) Give **two** examples of products that use a smart material.

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

2 ..... **[1]**

(ii) Explain why shape memory alloys are known as 'smart materials.'

.....

.....

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

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8* Discuss the impact of systems and control technology on **safety** during engineering production.

.....

.....

.....

.....

.....

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.....

.....

.....

.....

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

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