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Centre number						Candidate number				
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**OXFORD CAMBRIDGE AND RSA EXAMINATIONS
GCSE**

A624/02

ENGINEERING

Impact of Modern Technologies on Engineering

TUESDAY 31 JANUARY 2012: Afternoon

DURATION: 1 hour

SUITABLE FOR VISUALLY IMPAIRED CANDIDATES

Candidates answer on the Question Paper.

OCR SUPPLIED MATERIALS:

None

OTHER MATERIALS REQUIRED:

None

READ INSTRUCTIONS OVERLEAF

INSTRUCTIONS TO CANDIDATES

- **Write your name, centre number and candidate number in the boxes on the first page. 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).**

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 (*).**

1 Engineering sectors produce different products.

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

ENGINEERING SECTOR		PRODUCT
Aerospace	—	Life raft
Rail and Marine	—	Pedestrian bridge
Automotive	—	Satellite solar panel
Structural and Civil	—	Dishwasher powder
Computers, Communication and IT	—	Parking sensors
Chemical and Process	—	Infra red mouse

[6]

(b) Select ONE product from those listed above and state:

- **ONE modern technology used in its production**
- **ONE benefit of using that modern technology**

Product _____

Modern technology _____ **[1]**

Benefit _____ **[1]**

2 (a) Describe TWO ways in which the use of modern technology has increased the volume of production in the engineering industry.

1 _____

_____ [2]

2 _____

_____ [2]

(b) Modern technology has resulted in a number of disadvantages to engineering companies.

Describe TWO disadvantages of the introduction and use of modern technology to engineering companies.

Disadvantage 1 _____

_____ [2]

Disadvantage 2 _____

_____ [2]

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

C _____

A _____

M _____ [1]

(b) Explain how computer control is used in TWO different engineering processes.

1 _____

_____ [3]

2 _____

_____ [3]

4 Engineered products could go through the following stages during production.

**MATERIAL REMOVAL
SHAPING AND MANIPULATION
JOINING AND ASSEMBLY
SURFACE FINISHING**

(a) State TWO different machines that could be used in the 'material removal' stage.

1 _____ [1]

2 _____ [1]

(b) State TWO different hazards that are present during the 'shaping and manipulation' stage.

1 _____ [1]

2 _____ [1]

(c) State TWO different hand tools that could be used in the 'joining and assembly' stage.

1 _____ [1]

2 _____ [1]

(d) State TWO different surface finishing processes used on engineered products.

1 _____ [1]

2 _____ [1]

5 Modern factories are designed to have less impact on the environment than in the past.

(a) Describe TWO ways older factories can cause damage to the environment.

1 _____

_____ [2]

2 _____

_____ [2]

(b) Describe TWO ways in which damage to the environment caused by factories can be reduced.

1 _____

_____ [2]

2 _____

_____ [2]

6 Describe ONE different health and safety consideration for each of the following engineering processes.

(i) Drilling _____

_____ [2]

(ii) Soldering _____

_____ [2]

(iii) Vacuum forming _____

_____ [2]

7 Engineered products are often made using materials from the groups listed below.

NON-FERROUS METALS

POLYMERS

FERROUS METALS

(a) Explain, using ONE example, why low carbon (mild) steel is used rather than a non-ferrous metal.

[3]

(b) Explain, using ONE example, what is meant by the term 'polymers'.

[3]

(c) Explain, using ONE example, why a polymer has replaced a metal material in an engineered product.

[3]

8* Discuss the effects that modern technologies have had on the working conditions of the workforce.

[6]



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