



**DESIGN TECHNOLOGY
STANDARD LEVEL
PAPER 2**

Tuesday 11 November 2008 (afternoon)

1 hour

Candidate session number

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INSTRUCTIONS TO CANDIDATES

- Write your session number in the boxes above.
- Do not open this examination paper until instructed to do so.
- Section A: answer all of Section A in the spaces provided.
- Section B: answer one question from Section B. Write your answers on answer sheets. Write your session number on each answer sheet, and attach them to this examination paper and your cover sheet using the tag provided.
- At the end of the examination, indicate the numbers of the questions answered in the candidate box on your cover sheet and indicate the number of sheets used in the appropriate box on your cover sheet.

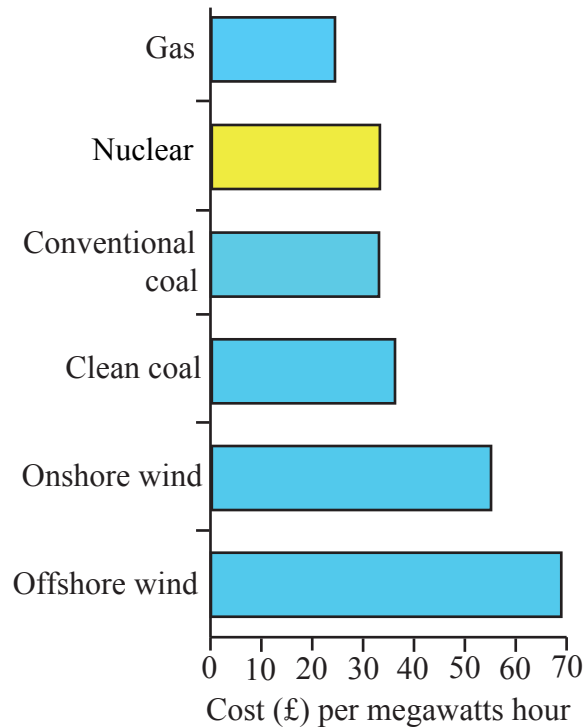


SECTION A

Answer **all** the questions in the spaces provided.

- 1. The bar chart in **Figure 1** shows data presented to the UK government in October 2005 by the Engineering Employers Federation to try and persuade the government to change its policy of abandoning nuclear power as a future source of energy. The chart shows a comparison between the cost of different types of energy in a fluctuating market.

Figure 1: Chart of energy costs 2005 (UK)



[Source: Engineers Employer Federation, published in The Times (UK), 24 October 2005]

- (a) (i) State the difference between the cost of energy from gas and the cost of energy from nuclear fuel. [1]

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- (ii) List **two** reasons why coal remains a popular source of energy. [2]

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(This question continues on the following page)



(Question 1 continued)

- (b) (i) Based on the data in Figure 1 outline why the government may reconsider its policy of abandoning nuclear fuel. [2]

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- (ii) Outline **one** factor which may contribute to a fluctuating market for energy. [2]

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- (iii) Describe the general pattern of energy costs shown in the chart in Figure 1. [2]

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- (c) Explain why wind power that is generated offshore (on the ocean) is consistently higher in cost than wind power that is generated onshore (on land). [3]

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- 2. (a) Define *robot*. [1]

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- (b) Outline **one** disadvantage of a robotic domestic vacuum cleaner. [2]

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3. (a) Outline how legislation could act as an impetus for clean technology. [2]

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(b) State **one** advantage of energy labelling for consumers. [1]

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4. Compare ductility with malleability. [2]

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SECTION B

Answer **one** question. Write your answers on the answer sheets provided. Write your session number on each answer sheet, and attach them to this examination paper and your cover sheet using the tag provided.

5. **Figure 2** shows a portable radio originally designed in 1963 but still a popular product. The two cubes with rounded corners are joined with a hinge so the radio can be closed. It is not available with digital sound and costs £150. It is produced in a colour range of white, black and orange and the casing is made from a thermoset plastic.

Figure 2: Portable radio (model TS522) made by Brionvega



[Source: www.atomicinteriors.co.uk]

- (a) (i) Outline **one** reason why the corners of the radio are rounded. [2]
- (ii) Outline **one** reason for designing the radio so it can be closed. [2]
- (iii) Explain **one** reason for producing the radio in a limited range of colours. [3]
- (b) (i) Outline the life cycle stage of the radio. [2]
- (ii) Describe **one** way in which the use of a thermoset plastic contributes to ease-of-manufacture of the radio. [2]
- (c) Discuss **three** possible reasons why the design of the radio has remained appealing to consumers for the past 40 years. [9]

6. **Figure 3** shows a Sony Walkman which has an aluminium metal body and is water resistant. It is marketed as a “gym buddy” and its features include a sensor to count steps on a gym treadmill, distance travelled and calories burnt. It has a one-line LCD display, a radio station tuner, and the battery lasts for 18 hours before needing a recharge.

Figure 3: “Gym buddy” Sony Walkman



[Source: www.sony.co.uk]

- (a) (i) Outline **one** reason why the Walkman is made from metal. [2]
- (ii) State the most likely manufacturing technique used for making the metal body. [1]
- (b) (i) Describe **one** performance test useful in the design of the Walkman. [2]
- (ii) Explain the importance of ease-of-use as part of a product evaluation for the Walkman. [3]
- (c) Explain how aesthetic considerations have affected the design of the Walkman. [3]
- (d) Discuss how planned obsolescence impacts on **three** aspects of the design of the Walkman. [9]



7. **Figure 4** shows a folding chair made from hardwood and available from Ikea stores or mail order. Ikea is a multi-national company with stores in different parts of the world.

Figure 4: hardwood folding chair



[c. Inter IKEA Systems B.V. 2008]

- (a) (i) List **two** joining techniques used in the construction of the chair. [2]
- (ii) Outline **one** reason for the choice of timber. [2]
- (b) (i) Outline **one** design consideration for the surface finish of the chair. [2]
- (ii) Explain **one** issue related to the concept of repair for the chair pictured in Figure 4. [3]
- (c) Outline the most likely scale of production for the chair. [2]
- (d) Discuss **three** ergonomic considerations for the design of the chair [9]