**Energy**

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| Instructions to students  • You have 50 minutes to complete the test.  • Please answer all questions in the spaces provided.  • There is to be no talking during the test. | Marks  Section I: Multiple-choice questions: 5 marks  Section II: Short-answer questions: 12 marks  Section III: Extended-response questions: 8 marks  Total: 25 marks |

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| Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_  Class: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ | Score: /25  Grade: % |
| Comments: | |

Section I: Multiple-choice questions

For each question, circle or highlight the correct answer.

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| 1 A toaster converts: | |  |
| A | electrical energy into heat energy. |
| B | gravitational energy into chemical energy. |
| C | kinetic energy into heat energy. |
| D | chemical energy into sound energy. |
| 2 Which of the following examples has the most kinetic energy? | | |
| A | A car travelling at 100 km/h. | |
| B | A cricket ball travelling at 100 km/h. | |
| C | A bus travelling at 100 km/h. | |
| D | A motorcycle travelling at 100 km/h. | |
| 3 Which one of the following inventions converts sunlight energy into electricity? | | |
| A | Compact fluorescent lights | |
| B | Photovoltaic cells | |
| C | Incandescent lights | |
| D | Light-emitting diodes | |

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| 4 What sort of energy is stored in petrol? | |
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| A | Gravitational potential energy |
| B | Biomass energy |
| C | Chemical potential energy |
| D | Light energy |
| 5 If the input energy into a system is 80 units, and the output energy is 20 units, the energy efficiency is: | |
| A | 20%. |
| B | 80%. |
| C | 10%. |
| D | 25%. |

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|  | Section I  Total marks:  /5 marks |

Section II: Short-answer questions

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| 6 Describe how a bow and arrow transforms potential energy to kinetic energy. | |
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|  | /2 marks |
| 7 Give two different examples of how thermal energy can be generated. | |
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|  | /2 marks |
| 8 The energy efficiency of a light globe was calculated to be 80%. What is the law of conservation of energy and how does it explain why the light globe efficiency isn’t 100%? | |
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|  | /3 marks |
| 9 Calculate the energy efficiency of a fan that produces 12 units of energy output for every 20 units of input. | |
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|  | /2 marks |

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| 10 Some hydroelectric plants work by placing turbines under waterfalls. The water falls onto a turbine and spins it around, thereby generating electricity. Describe how this process works in terms of energy transformation. | |
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|  | /3 marks |
|  | Section II  Total marks:  /12 marks |

Section III: Extended-response questions

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| 11 Provide two examples of improving the energy efficiency of a house and explain how they reduce the amount of electricity required. | |
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|  | /4 marks |

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| 12 Draw an energy flow diagram to show all the energy transformations occurring in a mobile phone being used with headphones to listen to music. | |
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|  | /4 marks |
|  | Section III  Total marks:  /8 marks |