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Province of the

**EASTERN CAPE**

EDUCATION

**SENIOR**

**PHASE**

**GRADE 9**

**NOVEMBER 2010**

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| **TECHNOLOGY**  **MARKING GUIDELINE** |

**MARKS: 100**

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| This memorandum consists of 10 pages. |

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| **INSTRUCTIONS AND INFORMATION** |

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| 1. | Learners answer all the questions from SECTIONS A,B,C and D, and one question from SECTION E. |

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| 2. | Sketches must be clear, neat and done in pencil. |

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| **ALLOCATION OF MARKS** | | | |
| SECTION A: | MULTIPLE CHOICE QUESTIONS | | |
|  | QUESTION 1 | | [10] |
| SECTION B: | STRUCTURES AND SYSTEMS AND CONTROL (Mechanical Systems) | | |
|  | QUESTION 2 | (15) |  |
| QUESTION 3 | (15) | [30] |
| SECTION C: | PROCESSING | | |
|  | QUESTION 4 | (14) |  |
| QUESTION 5 | (6) | [20] |
| SECTION D: | SYSTEMS AND CONTROL (Electrical Systems) | | |
|  | QUESTION 6 | (11) |  |
| QUESTION 7 | (9) | [20] |
| SECTION E: | PROCESSING (QUESTION 8)  OR  ELECTRICAL SYSTEMS (QUESTION 9) | (20)  (20) | [20] |

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| **SECTION A: MULTIPLE CHOICE QUESTIONS** |

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| **QUESTION 1** |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 1.1 | A | √ |  |  |
| 1.2 | C | √ |  |  |
| 1.3 | A | √ |  |  |
| 1.4 | C | √ |  |  |
| 1.5 | D | √ |  |  |
| 1.6 | B | √ |  |  |
| 1.7 | C | √ |  |  |
| 1.8 | C | √ |  |  |
| 1.9 | A | √ |  |  |
| 1.10 | B | √ | (10 x 1) | **[10]** |
|  |  |  |  |  |
|  |  |  | **TOTAL SECTION A:** | **10** |
|  | | | |  |
| **SECTION B: STRUCTURES AND SYSTEMS AND CONTROL (Mechanical Systems)** | | | | |

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| **QUESTION 2** |

|  |  |  |  |  |  |  |
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| 2.1 |  | Property | | Definition | |  |
|  | 1 | tensile strength | √ | This is the strength needed to pull a material apart by breaking the atoms. | √ |  |
|  | 2 | hardness | √ | This is when one material is hard enough to cut another material | √ |  |
|  | 3 | conductivity | √ | Electricity can easily flow through this material | √ | (6) |
|  |  |  | | | | |
| 2.2 | 1 | beam | | | √ |  |
|  | 2 | column | | | √ |  |
|  | 3 | strut | | | √ |  |
|  | 4 | stay / guy | | | √ |  |
|  | 5 | buttress | | | √ | (5) |
|  |  |  | | |  |  |
| 2.3 | 2.3.1 | 40 000 N **+** 8 000 N = 48 000 N | | | √ |  |
|  |  |  | | |  |  |
|  | 2.3.2 | 8 000 N **+** ½ of 40 000 N = 28 000 N | | | √ |  |
|  |  |  | | |  |  |
|  | 2.3.3 | FIGURE 1 or FIGURE 3  Because the tractor (the load) is only on one side of the bridge. | | | √√ | (4) |
|  |  |  | | |  | **[15]** |

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| **QUESTION 3** |

|  |  |  |  |  |  |  |
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| 3.1 | 3.1.1 | A pulley is a grooved solid wheel in which a rope, belt or chain can fit. | | | √ |  |
|  |  |  | | |  |  |
|  | 3.1.2 | A drive pulley is the powered pulley and the driven pulley is the one that move as a result of drive pulley. /  As the driver pulley rotates, the belt moves causing the driven pulley to rotate.  *(Any other acceptable answer).* | | | √ |  |
|  |  |  | | |  |  |
|  | 3.1.3 | By twisting the rope or belt. | | | √ |  |
|  |  |  | | |  |  |
|  | 3.1.4 | *1 mark for twisting of rope*  *2 marks for two pulleys*  *1 mark for rotation direction of pulleys* | | | √  √√  √ | (7) |
|  |  |  | | |  |  |
| 3.2 | **A** | ratchet | | | √ |  |
|  |  |  | | |  |  |
|  | **B** | pawl | | | √ | (2) |
|  |  |  | | |  |  |
| 3.3 | 3.3.1 | 80 teeth | | | √ |  |
|  |  |  | | |  |  |
|  | 3.3.2 | 70 ÷ 2 = 35 revolutions per minute | | | √ |  |
|  |  |  | | |  |  |
|  | 3.3.3 | Anticlockwise | | | √ |  |
|  |  |  | | |  |  |
|  | 3.3.4 | *Mechanical Advantage =* | *number of teeth on driven gear* | |  |  |
|  |  | *number of teeth on driver gear* | |  |  |
|  |  |  |  | |  |  |
|  |  |  | 80 teeth | = 2 | √ |  |
|  |  |  | 40 teeth | √ |  |
|  |  |  |  |  |  |  |
|  |  | *Mechanical Advantage =* | 2:1 |  | √ | (6) |
|  |  |  |  |  |  | **[15]** |
|  |  |  |  |  |  |  |
|  |  |  | **TOTAL SECTION B:** | |  | **30** |

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| **SECTION C: PROCESSING** |  |

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| **QUESTION 4** |

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| 4.1 | 4.1.1 | *Name ONE reason why food manufacturers add additives to food.* |  |  |
|  |  | * to make food look good; * to make food taste different; * to improve nutritional value; * to improve the quality of food; * to make food last longer;   *(Any ONE or other acceptable reason)* | √ | (1) |
|  |  |  |  |  |
|  | 4.1.2 | *What is the negative behavioural effect of additives?* |  |  |
|  |  | * Temper tantrums   or   * hyperactivity   *(Any One of the above)* | √ | (1) |
|  |  |  |  |  |
|  | 4.1.3 | *Name any ONE of the foods that contain harmful additives.* |  |  |
|  |  | * sweets; * cakes; * biscuits; * fish fingers; * tin foods; etc   *(Any ONE of the above)* | √ | (1) |
|  |  |  |  |  |
|  | 4.1.4 | *How could hyperactive behaviour be improved?* |  |  |
|  |  | * Remove artificial colouring and * preservatives such as sodium benzoate from diet. | √√ | (2) |

|  |  |  |  |  |
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| 4.2 | 4.2.1 | * Make it safer to eat * Make it easier to eat * Make it last longer or to preserve it * Improve the quality for eating * Make it easier to digest * Make it easier to transport * Provide it at a cheaper price, especially if it is processed when it is in season   *(Any THREE reasons)* | √  √  √ | (3) |
|  |  |  |  |  |
|  | 4.2.2 | * The loss of some nutrients, especially water-soluble vitamins * Higher prices   *(Any ONE disadvantage)* | √ | (1) |

|  |  |  |  |  |  |  |
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| 4.3 | 4.3.1 | | B | | √ |  |
|  |  | |  | |  |  |
|  | 4.3.2 | | E | | √ |  |
|  |  | |  | |  |  |
|  | 4.3.3 | | A | | √ |  |
|  |  | |  | |  |  |
|  | 4.3.4 | | C | | √ |  |
|  |  | |  | |  |  |
|  | 4.3.5 | | D | | √ | (5) |
|  |  | |  | |  | **[14]** |
|  |  | |  | |  |  |
| **QUESTION 5** | | | | | | |
|  | | | | | | |
| 5.1 | |  | | Exposure to moisture and oxygen  OR  Exposure to air and water | √√ | (2) |
|  | |  | |  |  |  |
| 5.2 | | **A** | | electroplating | √ |  |
|  | |  | |  |  |  |
|  | | **B** | | painting | √ |  |
|  | |  | |  |  |  |
|  | | **C** | | varnishing | √ |  |
|  | |  | |  |  |  |
|  | | **D** | | galvanising | √ | (4) |
|  | |  | |  |  | **[6]** |
|  | |  | |  |  |  |
|  | |  | | **TOTAL SECTION C:** | | **20** |

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| **SECTION D: SYSTEMS AND CONTROL (Electrical Systems)** |

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| **QUESTION 6** |

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| 6.1 | **Letter of Component**  **(A, B, C,**  **D, E or F)** | **Name of component** | **Input /**  **Process /**  **Output** | **Function** |  | |  |
|  | **A** | Battery | Input | Power source / cells that produce an electrical current |  | |  |
|  | **B** | Switch | Input | Used to turn a circuit on or off / controls the flow of electrical current in a circuit |  | |  |
|  | **C** | Resistor | Process | Controls the amount of current flowing in a circuit / deliberately slows or stops the flow of electricity. |  | |  |
|  | **D** | Light-emitting diodes  (LED) | Output | Allows current to flow in one direction only / used to form letters and numbers, e.g. on display of calculators |  | |  |
|  | **E** | Capasitor | Process | It stores and releases electrical energy on a continuous basis |  | |  |
|  | **F** | Buzzer | Output | It produces a sound when current flows through it |  | |  |
|  |  |  |  |  |  | |  |
|  |  | (½ mark each x 4)  = 2 | (½ mark  each x 4)  = 2 | (1 mark each x 4)  = 4 |  | | (8) |
|  |  |  |  |  |  | |  |
| 6.2 | * It is a special type of resistor that detects light or dark and whose resistance changes as the light intensity falling on it changes. * When it is light, the resistance of the LDR increases to a point where current does not flow. * When it is dark, the resistance decreases the current that flows in the circuit and the light goes on | | | | √  √  √ | | (3) |
|  |  | | | |  |  | **[11]** |

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| **QUESTION 7** |

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| 7.1 | 7.1.1 | Transistor | √ | (1) |
|  |  |  |  |  |
|  | 7.1.2 | * Transistors operate as electronic switches (they allow or don’t allow current to flow) | √ |  |
|  |  | * Transistors can operate as amplifiers (they enlarge – make bigger – the input signal that they received) | √ | (2) |
|  |  |  |  |  |
|  | 7.1.3 | collector (√)  base  (√)  emitter (√)  3 marks for correct sketch / symbol |  | (6) |
|  |  |  |  | **[9]** |
|  |  |  |  |  |
|  |  | **TOTAL SECTION D:** | | **20** |

|  |  |
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| **SECTION E : CHOICE QUESTION** | |
|  |  |
| *Learners answer EITHER QUESTION 8 OR QUESTION 9.* | |
|  | |
| **QUESTION 8: PROCESSING** | |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 8.1 | **Food Products** | **PRESERVING TECHNIQUES** | | | | |  | |  |
| **Freezing** | **Drying** | **Canning** | **Pickling** | **Salting** |  | |  |
|  | Beef | x | x | x |  | x |  | |  |
|  | Peaches |  | x | x |  |  |  | |  |
|  | Beans |  | x | x |  |  |  | |  |
|  | Tomatoes |  | x | x |  |  |  | |  |
|  | Fish | x | x | x | x | x |  | |  |
|  |  | | | | | | | |  |
|  | *Learners choose any TWO preserving techniques for each food product* | | | | | | |  | (10) |
|  |  | | | | | | |  |  |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 8.2 | 8.2.1 | * It keeps water and air away from the surface of the metal. * Improves the appearance and lifespan of metal * Resistance to corrosion   *(Any TWO of the above or any other acceptable answers)* | √√ |  |
|  |  |  |  |  |

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | | 8.2.2 | | | The metal underneath it will corrode (rust). | | | √ |  |
|  | |  | | |  | | |  |  |
|  | | 8.2.3 | | * steel parts of cars or trucks * electrical connectors * steel bolts * steel or aluminium parts in light fittings * jewellery   *(Any THREE of the above or any other acceptable answers)* | | | | √  √√ |  |
|  | |  | |  | | | |  |  |
|  | | 8.2.4 | | * chrome plating * silver plating * gold plating * copper plating * nickel plating * zinc plating   *(Any FOUR of the above or any other acceptable answers)* | | | | √  √  √  √ | (10) |
|  | |  | |  | | | |  | **[20]** |
|  | |  | |  | | | |  |  |
| **QUESTION 9: ELECTRICAL SYSTEMS** | | | | | | | | |  |
|  |  | |  | | | | |  |  |
| 9.1 | 9.1.1 | | **Resistor 1** | | | | |  |  |
|  |  | |  | | |  |  |  |  |
|  |  | | blue in the 1st band | | | = | 6 |  |  |
|  |  | | orange in the 2nd band | | | = | 3 |  |  |
|  |  | | red in the 3rd band | | | = | 00 |  |  |
|  |  | | = 6300 Ω | | | | |  |  |
|  |  | | *(One mark for 6; one mark for 3 and one mark for 00)* | | | | | √√√ |  |
|  |  | |  | | | | |  |  |
|  |  | | **Resistor 2** | | | | |  |  |
|  |  | | yellow in the 1st band | | | = | 4 |  |  |
|  |  | | red in the 2nd band | | | = | 2 |  |  |
|  |  | | red in the 3rd band | | | = | 00 |  |  |
|  |  | | = 4200 Ω | | | | |  |  |
|  |  | | *(One mark for 4; one mark for 2 and one mark for 00)* | | | | | √√√ | (6) |
|  |  | |  | | | | |  |  |
|  | 9.1.2 | | Silver = ±10 % | | | | | √ | (1) |

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
|  | 9.1.3 | (a) | 1st | Band 3 | = Orange | √ |  |
|  |  |  | 2nd | Band 9 | = White | √ |  |
|  |  |  | 3rd | Band 0000 | = Yellow | √ |  |
|  |  |  |  |  |  |  |  |
|  |  | (b) | 1st | Band 2 | = Red | √ |  |
|  |  |  | 2nd | Band 0 | = Black | √ |  |
|  |  |  | 3rd | Band (blank) | = Black | √ | (6) |

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| 9.2 | 9.2.1 | Thermistor | √ | (1) |
|  |  |  |  |  |
|  | 9.2.2 | *(One mark for the rectangle and one mark line through the rectangle)* | √√ | (2) |
|  |  |  |  |  |
|  | 9.2.3 | * hot water geysers, * fire sensors, * electric blankets, * toasters, * kettles, * heaters, * irons,   *(Any FOUR of the above or other acceptable appliances)* | √√√√ | (4) |
|  |  |  |  | **[20]** |
|  |  |  |  |  |
|  |  | **TOTAL SECTION E:** | | **20** |
|  |  |  | |  |
|  |  | **GRAND TOTAL:** | | **100** |