

Annual Examinations for Secondary Schools 2014

**FORM 5 DESIGN & TECHNOLOGY MARKING SCHEME**

**SECTION A: DESIGN**


| QUESTION NUMBER | ANSWER  | MARKS ALLOTTED |
|-----------------|---|----------------|
| 1               | a.  | 1 × 3 = 3      |
|                 | b.  |                |
| 2               | Acceptable answers should include aesthetic features such as: size, colour, proportion, finish etc.   |                |
| 2               | Acceptable answers should include environmental friendly material, recyclable, minimal use of material etc.   |                |
| 2               | Any answers should be relevant to the chosen product.   | 1 × 4 = 4      |
| 3               | Award marks as follows:<br><i>2 marks for Clarity of Idea</i><br><i>1 mark for Notes</i><br><i>1 mark for Dimensions or portion sizes</i><br><i>1 mark for Colour</i>   | 5              |
| 4               | For the trophy and banner the answer should be One off as only one customised product is needed. The electronic gadget and lunch should be produced in batch production since a specific number is going to be made for the particular event.<br><i>1 mark for correct production method</i><br><i>2 marks for reason</i> | 3              |
| 5               | A simple work plan should be made indicating the main steps to produce the product.<br><i>3 marks for main steps</i><br><i>2 marks for chronologic sequence</i>   | 5              |

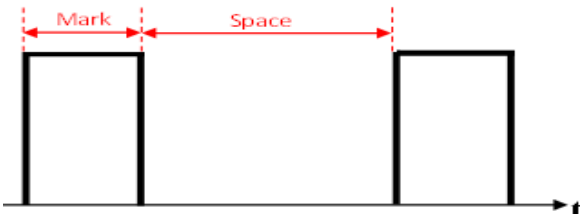
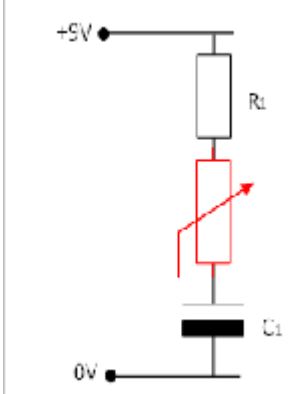

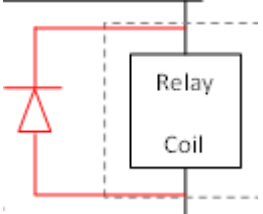
**SECTION B: RESISTANT MATERIALS**

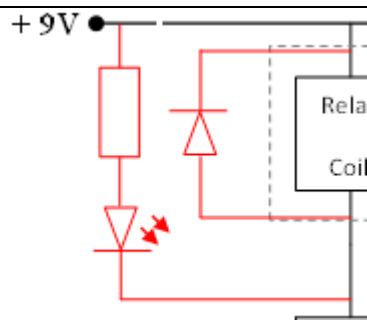
| QUESTION NUMBER | ANSWER  | MARKS ALLOTTED             |
|-----------------|---|----------------------------|
| 6               | a.  | $\frac{1}{2} \times 2 = 1$ |
|                 | b.  |                            |
| 7               | a.  | 1                          |
|                 | b.  |                            |
|                 | Thermosetting plastic is a plastic that once set in shape, cannot be reheated and reshaped. Such plastic are generally stronger than other plastics.  |                            |
|                 | Press-moulding is a manufacturing process where an upper mould presses a material into a bottom mould to form the desired product.  | 1                          |
|                 | by means of adhesive  | 1                          |
|                 | Any two from the following or other relevant answers:<br><ul style="list-style-type: none"> <li>• transparency so as to see the fish inside the tank;</li> <li>• hardness so as to reduce surface scratching;</li> <li>• strength so as to contain the weight of the water inside it.</li> </ul> <i>½ mark for each property</i><br><i>1 mark for each reason</i> | 3                          |

|           |           |   |                            |
|-----------|-----------|---|----------------------------|
|           | <b>c.</b> | Students should show a curved jig/mould and a means of heating up the sheet.<br><i>1 mark for showing the jig</i><br><i>1 mark for showing a heat source</i>  | 2                          |
| <b>8</b>  |           | marking out → drilling/chain drilling → sawing → filing/sanding down  | $\frac{1}{2} \times 4 = 2$ |
| <b>9</b>  | <b>a.</b> | INPUT: motor rotating<br>OUTPUT: flap rotating/flap opening and closing   | $1 \times 2 = 2$           |
|           | <b>b.</b> | i. anti-clockwise   | $1 \times 2 = 2$           |
|           |           | ii. clockwise   |                            |
| <b>10</b> | <b>a.</b> | There is a range of possible answers, such as using gears, pulleys & belt or sprocket & chain. The diameter of the part attached to the motor shaft should be smaller than the diameter of the part attached to the central pulley shaft.<br><i>1 mark for showing a correct mechanism</i><br><i>1 mark for showing a reduction ratio</i><br><i>1 mark for proper labelling</i>   | 3                          |
|           | <b>b.</b> | Any one from the following or other relevant answers: <ul style="list-style-type: none"> <li>reducing the area of the hole in the aquarium top so that the cable is covered;</li> <li>moving the left roller further apart so that the cable is not in the way;</li> <li>making a hole in the flap and attaching the food container to the flap so that the food flakes fall when the cable is held back from the hole.</li> </ul> Use your discretion to award marks according to the level of taught behind the modification. | 3                          |

**SECTION C: ELECTRONICS**

| QUESTION NUMBER | ANSWER                     |  |       | MARKS ALLOTTED             |         |        |              |                            |
|-----------------|----------------------------|--|-------|----------------------------|---------|--------|--------------|----------------------------|
| <b>11</b>       | Block Diagram              |  |       | 1                          |         |        |              |                            |
| <b>12</b>       | <b>a.</b>                  | Light sensor -- Darlington pair transistor -- Motor  |       | $\frac{1}{2} \times 6 = 3$ |         |        |              |                            |
|                 | <b>b.</b>                  | <table border="1"> <thead> <tr> <th>INPUT</th> <th>PROCESS</th> <th>OUTPUT</th> </tr> </thead> <tbody> <tr> <td>Light sensor</td> <td>Darlington Pair Transistor</td> <td>Motor</td> </tr> </tbody> </table> | INPUT |                            | PROCESS | OUTPUT | Light sensor | Darlington Pair Transistor |
| INPUT           | PROCESS                    | OUTPUT   |       |                            |         |        |              |                            |
| Light sensor    | Darlington Pair Transistor | Motor  |       |                            |         |        |              |                            |
| <b>13</b>       | AND Gate                   |   |       | $\frac{1}{2} \times 2 = 1$ |         |        |              |                            |

| 14   | a.   | Astable type waveform  | 1                          |      |       |   |   |  |                           |  |   |  |  |   |  |  |   |                            |
|--|--|--|----------------------------|------|-------|---|---|--|---------------------------|--|---|--|--|---|--|--|---|----------------------------|
|  | b.   |   | $\frac{1}{2} \times 2 = 1$ |      |       |   |   |  |                           |  |   |  |  |   |  |  |   |                            |
|  | c.   | Time = $R_1 \times C_1$<br>Time = $(10 \times 10^3) \times (100 \times 10^{-6})$<br>Time = 1 sec<br><i>1 mark for working</i><br><i>1 mark for correct answer</i>  | 2                          |      |       |   |   |  |                           |  |   |  |  |   |  |  |   |                            |
|  | d.   |    | 1                          |      |       |   |   |  |                           |  |   |  |  |   |  |  |   |                            |
|  | e.   | Total time = $R_t \times C$<br>$= [(10 \times 10^3) + (1 \times 10^6)] \times (100 \times 10^{-6})$<br>$= 101 \text{ sec}$<br><i>2 marks for working</i><br><i>1 mark for correct answer</i>   | 3                          |      |       |   |   |  |                           |  |   |  |  |   |  |  |   |                            |
| 15   | a.   | A switch that when pressed and released it always returns to its original state.   | 1                          |      |       |   |   |  |                           |  |   |  |  |   |  |  |   |                            |
|  | b.   |   | $\frac{1}{2} \times 2 = 1$ |      |       |   |   |  |                           |  |   |  |  |   |  |  |   |                            |
| 16   | a.   | <table border="1"> <thead> <tr> <th></th> <th>True</th> <th>False</th> </tr> </thead> <tbody> <tr> <td>A relay is an electro mechanical type switch.</td> <td>✓</td> <td></td> </tr> <tr> <td>The relay is a SPDT type.</td> <td></td> <td>✓</td> </tr> <tr> <td>The motor always turns in one direction.</td> <td></td> <td>✓</td> </tr> <tr> <td>There is only ONE power supply in the circuit.</td> <td></td> <td>✓</td> </tr> </tbody> </table> |                            | True | False | A relay is an electro mechanical type switch. | ✓ |  | The relay is a SPDT type. |  | ✓ | The motor always turns in one direction. |  | ✓ | There is only ONE power supply in the circuit. |  | ✓ | $\frac{1}{2} \times 4 = 2$ |
|  |  | True   | False                      |      |       |   |   |  |                           |  |   |  |  |   |  |  |   |                            |
| A relay is an electro mechanical type switch.  | ✓  |  |                            |      |       |   |   |  |                           |  |   |  |  |   |  |  |   |                            |
| The relay is a SPDT type.                      |  | ✓  |                            |      |       |   |   |  |                           |  |   |  |  |   |  |  |   |                            |
| The motor always turns in one direction.       |  | ✓  |                            |      |       |   |   |  |                           |  |   |  |  |   |  |  |   |                            |
| There is only ONE power supply in the circuit. |  | ✓  |                            |      |       |   |   |  |                           |  |   |  |  |   |  |  |   |                            |
| b.   | <br><i>1/2 mark for correct use of symbol</i><br><i>1/2 mark for correct connection</i> | 1  |                            |      |       |   |   |  |                           |  |   |  |  |   |  |  |   |                            |

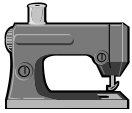



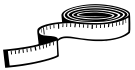

|  |    |  |   |
|--|----|--|---|
|  | c. |  <p>1 mark for correct use of symbols<br/>1 mark for correct design</p> | 2 |
|--|----|--|---|

**SECTION D: FOOD**

| QUESTION NUMBER                         | ANSWER   | MARKS ALLOTTED                          |  |                 |               |               |                  |              |                 |                  |              |           |
|---|--|---|--|-----------------|---------------|---------------|------------------|--------------|-----------------|------------------|--------------|-----------|
| 17                                      | Any two from the following or other relevant answers: <ul style="list-style-type: none"> <li>• to keep food fresh;</li> <li>• to be displayed safely;</li> <li>• aesthetic appeal – to display the meal in an attractive way for children;</li> <li>• to protect it from damage; odour; tampering; etc</li> <li>• to make it easier to transport.</li> </ul>   | 1 × 2 = 2                               |  |                 |               |               |                  |              |                 |                  |              |           |
| 18                                      | Any three from the following or other relevant answers: <ul style="list-style-type: none"> <li>• name of product;</li> <li>• list of ingredients;</li> <li>• weight;</li> <li>• name and address of manufacture;</li> <li>• storage instructions.</li> </ul>   | 1 × 3 = 3                               |  |                 |               |               |                  |              |                 |                  |              |           |
| 19                                      | Any one from the following or other relevant answers: <ul style="list-style-type: none"> <li>• for consumer safety – use by date, storage instructions, special claims made on diets</li> <li>• for consumer information – name of product, name of manufacturer, brand, ingredients used, weight etc.</li> </ul>  | 1                                       |  |                 |               |               |                  |              |                 |                  |              |           |
| 20                                      | Recycle  | 1                                       |  |                 |               |               |                  |              |                 |                  |              |           |
| 21                                      | <table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th colspan="2"><b>Ingredients for 20 Potato Scones</b></th> </tr> </thead> <tbody> <tr> <td>45 ml olive oil</td> <td>450g potatoes</td> </tr> <tr> <td>450g potatoes</td> <td>115g plain flour</td> </tr> <tr> <td>30 ml chives</td> <td>45 ml olive oil</td> </tr> <tr> <td>115g plain flour</td> <td>30 ml chives</td> </tr> </tbody> </table> | <b>Ingredients for 20 Potato Scones</b> |  | 45 ml olive oil | 450g potatoes | 450g potatoes | 115g plain flour | 30 ml chives | 45 ml olive oil | 115g plain flour | 30 ml chives | 1 × 4 = 4 |
| <b>Ingredients for 20 Potato Scones</b> |  |   |  |                 |               |               |                  |              |                 |                  |              |           |
| 45 ml olive oil                         | 450g potatoes  |   |  |                 |               |               |                  |              |                 |                  |              |           |
| 450g potatoes                           | 115g plain flour   |   |  |                 |               |               |                  |              |                 |                  |              |           |
| 30 ml chives                            | 45 ml olive oil  |   |  |                 |               |               |                  |              |                 |                  |              |           |
| 115g plain flour                        | 30 ml chives   |   |  |                 |               |               |                  |              |                 |                  |              |           |
| 22                                      | Fibre  | 1                                       |  |                 |               |               |                  |              |                 |                  |              |           |
| 23                                      | <b>a.</b> Any one from the following:<br>baking; broiling; grilling; sauté; shallow frying; barbecuing.<br><i>Do not accept frying; deep frying or roasting.</i>   | 1                                       |  |                 |               |               |                  |              |                 |                  |              |           |
|   | <b>b.</b> Protein  | 1                                       |  |                 |               |               |                  |              |                 |                  |              |           |
|   | <b>c.</b> <ul style="list-style-type: none"> <li>• Saturate fat is fat derived from animals, animal products and processed food.</li> </ul>  | 2                                       |  |                 |               |               |                  |              |                 |                  |              |           |

|    |    |  |                            |
|----|----|--|----------------------------|
|    |    | <ul style="list-style-type: none"> <li>• It is solid at room temperature.</li> <li>• It raises the 'bad' cholesterol.</li> </ul> <p><i>Other relevant answers should be considered.</i></p>  |                            |
| 24 | a. | <p>A vegan is a person who avoids all meat, seafood, poultry and any food derived from animal products.</p> <p><i>1 mark is given if the students give a simple answer such as 'does not eat meat/poultry/fish'.</i></p> <p><i>2 marks are given only if the students make a reference to food derived from animal sources such as 'eggs', 'milk' etc.</i></p> | 2                          |
|    | b. | <p>Vegans have to eat a mixture of vegetables to obtain their proteins. Some rich sources are: quinoa, tofu, soybeans, lentils, legumes, nuts, pulses, cereals, leafy vegetables, etc.</p> <p><i>Students should give two food sources.</i></p>  | $\frac{1}{2} \times 2 = 1$ |
|    | c. | <p>Any two from the following or other relevant answers:</p> <ul style="list-style-type: none"> <li>• they dislike the killing of animals for food;</li> <li>• they follow strict religious requirements;</li> <li>• for health reasons;</li> <li>• if followed in a proper way it is a very healthy diet.</li> </ul>  | $\frac{1}{2} \times 2 = 1$ |

**SECTION E: TEXTILES**

| QUESTION NUMBER | ANSWER  |                       |  | MARKS ALLOTTED              |
|-----------------|---|-----------------------|--|-----------------------------|
| 25              | <p>Possible Answer: Embroidery</p> <p>Reason: Since a blazer is considered to have a classic finish, embroidery is the most suitable since it gives an embossed classical appearance.</p> |                       |  | $1 \times 2 = 2$            |
| 26              | Picture   | Name                  | Use  | $\frac{1}{2} \times 10 = 5$ |
|                 |    | <u>Sewing Machine</u> | <u>To sew on fabrics</u>                         |                             |
|                 |    | Steam iron            | To remove creases from fabrics and to give shape |                             |
|                 |    | Seam ripper           | To undo seam and to cut buttonholes              |                             |
|                 |    | Needle and Tread      | To sew/mend fabrics by hand                      |                             |
|                 |    | Measuring tape        | To take measurements                             |                             |
|                 |    | Cutting Shears        | To cut fabrics                                   |                             |

|           |   |   |                            |
|-----------|---|---|----------------------------|
| <b>27</b> | Any two properties and reasons from the following:  |   | $\frac{1}{2} \times 4 = 2$ |
|           | Properties  | <ul style="list-style-type: none"> <li>• washable / resists repeated washing;</li> <li>• cool to wear;</li> <li>• easy to care / crease resistant.</li> </ul>                     |                            |
|           | Reason  | <ul style="list-style-type: none"> <li>• students dirt their uniforms very quickly;</li> <li>• cotton is absorbent and cool;</li> <li>• requires little or no ironing.</li> </ul> |                            |
| <b>28</b> | Any one from the following: <ul style="list-style-type: none"> <li>• because cotton fibres are strong;</li> <li>• because cotton fibres resist abrasion;</li> <li>• because cotton fibres absorb moisture.</li> </ul>   |   | 1                          |
| <b>29</b> | <b>a.</b>   | Buttons and buttonholes   | 2                          |
|           | <b>b.</b>   | Any one from the following: <ul style="list-style-type: none"> <li>• velcro;</li> <li>• press studs;</li> <li>• hooks and eyes.</li> </ul>  | 2                          |
| <b>30</b> | Any two from the following: <ul style="list-style-type: none"> <li>• fabric paint with a brush;</li> <li>• dye;</li> <li>• screen printing;</li> <li>• stencilling.</li> </ul>  |   | $1 \times 2 = 2$           |
| <b>31</b> | Any two from the following: <ul style="list-style-type: none"> <li>• felt;</li> <li>• vilene;</li> <li>• dacron</li> </ul>  |   | $1 \times 2 = 2$           |
| <b>32</b> | Any two from the following: <ul style="list-style-type: none"> <li>• Elastane and Lycra fibres make the fabric dry easily because they are lightweight.</li> <li>• They do not absorb water.</li> <li>• Swimwear made from Elastane and Lycra can improve performance because they fit firmly and closely.</li> <li>• They stretch a lot so do not inhibit body movements.</li> </ul> |   | $1 \times 2 = 2$           |