| Educational Assessme Annual Examination | OGY TIME: 2 hours | nt Unit s for Secondary Schools 2011 DESIGN & TECHNOLOGY |
|--|-------------------|--|
| DIRECTORATE FOF Department for Curric | CATION | R QUALITY AND STANDARDS IN EDUCATION sulum Management and eLearning |

----- Note to student: ------You are required to answer all questions

| | Areas corrected | | | | | | Marks | | |
|----------------|-----------------|----|----|----|----|-----------------|-----------------|-------|---------------|
| | D | RM | Е | Т | F | Written Exam | Design Folio | TOTAL | FINAL MARK |
| Max. Marks | 20 | 20 | 20 | 20 | 20 | 100 | 100 | 200 | % |
| Student's mark | | | | | | | | | |

FOR TEACHERS' USE ONLY

DISTRIBUTION OF MARKS

Enter student's mark obtained in every area of study in the above table. **D** for Design, **RM** for Resistant Materials, **E** for Electronics, **T** for Textiles technology and **F** for Food technology

SECTION A: DESIGN

Read this situation carefully before answering questions 1 to 3.

Situation:

StudentBounts.com The school administration has noticed that a number of students come to school without lunch. Every morning these students come to school with unhealthy take-away food like burgers, hotdogs, pastizzi and pizza they buy from a shop situated next to the school. The school administration wants to provide healthy snacks which can be bought during midday break from the school tuck shop at a minimal cost.

1. Write down a design brief for the given situation and underline TWO keywords in your design brief.

 $3 \text{ marks} + (1 \text{ mark} \times 2) = 5 \text{ marks}$

Give THREE design specifications that you would consider essential for an appropriate snack 2. required by your design brief.

 $1 \text{ mark} \times 3 = 3 \text{ marks}$

3. In the space provided below, draw a coloured sketch of one idea for your design brief. Give also an indication of portion size and the ingredients you intend to use.

- **a.** Designers study similar products that are already on the market so that they can 4. upon them. What is this study called?
- StudentBounts.com b. Study carefully the sports bag shown in Figure A, and then give ONE possible answer for each of the following questions.

| | i | Who will use this bag? | |
|----------|-----|-----------------------------|---|
| | ii | Where will the bag be used? | |
| Figure A | iii | What items will it hold? | |
| | | | $1 \operatorname{mark} \times 3 = 3 \operatorname{marks}$ |

SECTION B: RESISTANT MATERIALS

5. Laura built a model of a monster by using the following plastic objects:

• an empty ketchup bottle • a flexible tube • a balloon a take-away food box Figure B shows a diagram of how she assembled the objects together so that her monster can open its mouth.



a. State what happens to the balloon when the empty ketchup bottle is squeezed.

1 mark

b. Underline the correct mechanical system by which the monster works.

- cam and follower pulley and belt linkage pneumatic

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2 marks

| | the most suitable plastic from | which the empty | ketchup bottle can be | 16 |
|--|---|-----------------------------|------------------------|--------------|
| | Polyethylene | Acrylic | • GRP | 1 11 |
| d. Give TWC away food |) reasons why Expanded Poly boxes. | styrene (EPS) is u | sed for the manufactu | rre of take- |
| | | | 1 mark × | 2 = 2 marks |
| a. Give TWC as pliers an |) reasons why mild steel is no nd chisels. | t suitable for the n | nanufacture of cutting | tools such |
| | | | 1 mark × | 2 = 2 marks |
| b. Give ONE | example of a steel that can be | e used for making | cutting tools. | |
| | | | | 1 mark |
| The followin laminat | g is a list of manufacturing proion • extrusion • vacut | ocesses. Im forming • c | asting • injection | moulding |
| Use this list t process. | o fill in the boxes, matching e | each product to its | corresponding manuf | acturing |
| a. | alogija kothtak | | | |
| | plastic bathtub | • | • | |
| | | | | |
| b. | 3-ply plywo | od | | |
| b. | 3-ply plywo | od | • | |
| b. c. | plastic toy | ood | • | |
| b. c. ()) d. | plastic toy | od | • | |
| b. c. ()) d. | plastic toy metal section | n b | • | |
| b. c. (1) d. e. (2) | plastic toy metal section | n boot | • • | |

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a. Mark the EFFORT, LOAD and FULCRUM on Figure C. 8.



b. State what class of lever is the broom.

1 mark

c. The design of the broom needs to be improved by adding some form of rubber grip/s to make it more comfortable to use. Indicate where such grip/s can be placed by sketching on Figure C. 2 marks

SECTION C: ELECTRONICS

9. Figure D shows the top and bottom view of a Veroboard.

| $\begin{smallmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 &$ | |
|--|-------------|
| $\begin{smallmatrix} 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 & 0 \\ 0 & 0 &$ | |
| Top view | Bottom view |

Figure D

a. Which view is showing the side from where the legs of components are inserted?

b. Which view is showing the side from where soft solder is applied?

1 mark

1 mark

c. Mention TWO safety precautions that should be observed when soldering electronic components.

10. Mention the tool or equipment used for the following processes.

| Mention the tool or equipment used for the following processes | s. StudentBoy |
|---|---------------|
| PROCESS | TOOL/EQUIPMEN |
| measuring the current in electronic circuits | 5.6 |
| cutting excess lengths of the legs of electronic components after soldering | 13 |
| varying the value of a pre-set resistor | |
| soldering electronic components on a Veroboard | |

 $\frac{1}{2}$ mark x 4 = 2 marks

11. a. On the IC shown in Figure E, label Pin 1 and Pin 8.





b. A student needs a monostable timing of 2 seconds for his project. Figure F shows the electronic circuit involved with the NE555 to create the period of 2 seconds.





If C1 has a value of 100µF, calculate the value of R1 to produce a time period of 2 seconds. $(t = R \times C)$

2 marks

c. What component can be added to the electronic circuit, shown in Figure F, so that the student can vary the time?

1 mark



| averorms A and B show the tw | vo possible outputs of an NE555 IC. | .oou |
|------------------------------|-------------------------------------|---------|
| Waveform A | | 12 |
| | | |
| Waveform B | | |
| Which waveform shows an A | STABLE output? | |
| | 5 mbbb 0wipwi. | 2 marks |
| | | 2 ma |

12. a. In the space provided write the name of the TWO logic gate symbols shown below.





2 marks

b. Figure G shows the two logic gates connected to form a new logic gate function. Complete the truth table for this new function.



² marks

| | c. Complete the following electronic circuit be used for the INPUTS. You should als the OUTPUT. + | t diagram to include | a, showing TWO po e an LED in series | ossible comp with a fixed res | Rounz |
|----------------------------|---|------------------------------------|--|--|---------------------------------------|
| | |) | | | |
| | | | | | 3 marks |
| E | CTION D: FOOD | | | | |
| 1 | What is meant by a 'balanced diet'? | | | | |
| | | | | | |
| - | Name TWO different methods of processing | g milk. | | | 2 marks |
| - | Name TWO different methods of processing | g milk. | | 1 mark × 2 = | 2 marks |
| - | Name TWO different methods of processing The following is a list of foods. • yoghurt • lasagne Which ONE of them is processed by: | g milk. • wine | blue cheese | 1 mark × 2 = • pastry | 2 marks |
| -] i | Name TWO different methods of processing The following is a list of foods. • yoghurt • lasagne Which ONE of them is processed by: i. Mould? | g milk. | • blue cheese | 1 mark × 2 = • pastry | 2 marks |
| -] i i | Name TWO different methods of processing The following is a list of foods. • yoghurt • lasagne Which ONE of them is processed by: i. Mould? ii. Yeast? iii. Bacteria? | g milk. • wine | • blue cheese | $1 \operatorname{mark} \times 2 =$ • pastry $1 \operatorname{mark} \times 3 =$ | 2 marks 2 marks 3 marks |
| - - - i i i | Name TWO different methods of processing The following is a list of foods. • yoghurt • lasagne Which ONE of them is processed by: i. Mould? ii. Yeast? iii. Bacteria? A private hospital specialising in the cure of plan for a breakfast, lunch and supper for O dietary condition. | g milk. • wine f heart di NE day v | • blue cheese seases needs meals which takes into ac | 1 mark × 2 = • pastry 1 mark × 3 = on daily basis. count this partic | 2 marks 2 marks 3 marks Write a cular |
| | Name TWO different methods of processing The following is a list of foods. • yoghurt • lasagne Which ONE of them is processed by: i. Mould? ii. Yeast? iii. Bacteria? A private hospital specialising in the cure of plan for a breakfast, lunch and supper for Of dietary condition. Breakfast: | g milk. • wine f heart di NE day v | • blue cheese seases needs meals which takes into ac | 1 mark × 2 = • pastry 1 mark × 3 = • on daily basis. count this partic | 2 marks 2 marks 3 marks Write a cular |
| | Name TWO different methods of processing The following is a list of foods. • yoghurt • lasagne Which ONE of them is processed by: i. Mould? ii. Yeast? iii. Bacteria? A private hospital specialising in the cure of plan for a breakfast, lunch and supper for O dietary condition. Breakfast: Lunch: | g milk. wine f heart di NE day v | • blue cheese seases needs meals which takes into ac | 1 mark × 2 = • pastry 1 mark × 3 = • on daily basis. count this partic | 2 marks 2 marks 3 marks Write a cular |

17. The nutrition information on a label reads:

| | | S | |
|------------|---|--|--|
| bel reads: | | ldel | TR |
| RMATION | PER PACKET | PER 100G | 2LS |
| Kcal | | 394.5 | 2 |
| g | 2.5 | 7 | 0. |
| g | 22 | 68 | |
| 0 | | | |
| | bel reads: RMATION Kcal g g | bel reads: RMATION PER PACKET Kcal g 2.5 g 22 | bel reads: <u>RMATION PER PACKET PER 100G</u> Kcal 394.5 g 2.5 7 g 22 68 |

Find the energy value of one packet.

4 marks

18. Match the methods of cooking used with the description given.

| 1SteamingFood is immersed in a container of boiling fat.2Deep fryingFood is cooked in a frying pan with no additional fat.3Shallow fryingFood is cooked over a pan of boiling water | METHOD | | DESCRIPTION |
|---|--------|----------------|--|
| 2 Deep frying Food is cooked in a frying pan with no additional fat. 3 Shallow frying Food is cooked over a pan of heiling water. | 1 | Steaming | Food is immersed in a container of boiling fat. |
| 2 Shallow frying Each is applied over a new of hailing water | 2 | Deep frying | Food is cooked in a frying pan with no additional fat. |
| 5 Shallow frying Food is cooked over a pail of boining water. | 3 | Shallow frying | Food is cooked over a pan of boiling water. |

 $1 \operatorname{mark} x 3 = 3 \operatorname{marks}$

SECTION E: TEXTILES

19. Two origins of natural fibres are ANIMAL and VEGETABLE. Use a \checkmark to indicate from where the fibres for the following textile products originate.

| PRODUCT | ANIMAL ORIGIN | PLANT ORIGIN |
|---------------------------|---------------|--------------|
| A towel made of cotton | | |
| A jacket made of wool | | |
| A tie made of silk | | |
| A bed sheet made of linen | | |

1 mark x 4 = 4 marks

20. Mention TWO methods by which the edge of a piece of fabric can be finished.

1 mark x 2 = 2 marks

StudentBounty.com 21. List TWO methods that can be used to decorate the surface of a cushion made from fabric.

 $1 \operatorname{mark} x 2 = 2 \operatorname{mark}$

22. a. Give TWO properties that a fabric should have for the manufacture of swimwear.

1 mark x 2 = 2 marks

b. State ONE example of a synthetic fabric that satisfies the properties you mentioned above.

2 marks

23. Draw arrows to match each textile product to the most appropriate chemical treatment for it. One has been done for you.



 $^{1 \}text{ mark } x 4 = 4 \text{ marks}$

24. Give the meaning of the following pictograms or symbols found on textile products.



1 mark x 4 = 4 marks