Kulleġġ San Nikola Sekondarja Subien Naxxar
St Nicholas College Boys Secondary Naxxar
Half-Yearly Examinations

LEVELS

FORM 4 SUBJECT: Design & Technology TIME: 1½ hrs

Name: _____ Class: _____

For teachers use only:

	Written Exam				Portfolio				Total	%
	Design	Materials	Food	Total	Materials	Food	Total	%		
Maximum Marks	40	30	30	100	100	100	200	100	200	100
Student's Mark										

Your are required to answer all questions in the exam

SECTION A: DESIGN PROCESS **(Total Marks: 40)**

1) Below, is an incomplete table showing stages within the design process. Complete the Design Process sequence in the table.

The Design Process	
1	Situation
2	
3	
4	Initial Ideas
5	
6	
7	
8	Making
9	
10	Evaluation

(1/2 mark x 6 = 3 marks)

2) Consider the following situation.

A manufacturer wishes to extend the range of biscuit products for consumers with diabetes.

a) Answer the following questions:

- Who is the producer? _____
- What product are you assigned to produce? _____
- Who is the target group? _____

(1 mark x 3 = 3 marks)

b) Write a design brief:

_____

_____

(2 marks)

c) Write down three (3) key words from your design brief in question 2b.

i) _____

ii) _____

iii) _____

(1 mark x 3 = 3 marks)

3) It is expected that the manufacturer carries out research to help you determine the type of products that could be produced.

a) What does research mean?

_____

_____

(1 mark)

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b) What type of research does the designer need to perform?

_____

(1 mark)

c) In the space provided list TWO (2) research items you would expect the designer to find information about.

_____

_____

(2 marks)

4) List THREE (3) specifications that commonly occur in a food product.

_____

_____

_____

(3 marks)

5) Sketch TWO (2) ideas that you might consider for this project. In your answer add notes, dimensions, labelling, colour and a list of ingredients.

Idea 1

Idea 2

(4 marks x 2 = 8 marks)

6) Choose ONE (1) idea from the sketched ideas above (question 4) and give one reason for your answer.

Chosen Idea:	
Reason:	

(1,2 marks)

7) During the Making process, it is important for the manufacturer to keep record of quality and safety checks.

a) List TWO (2) quality checks used in the making process.

- _____
- _____

b) List TWO (2) safety checks used in the making process.

- _____
- _____

(4 marks x 4 = 4 marks)

8) After making the product, the manufacturer has to test the product.

a) Mention TWO (2) reasons of testing a product

- _____
- _____

(1 mark x 2 = 2 marks)

b) Mention ONE (1) method of testing a product

_____

(1 mark)

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9) The last stage of the design process is evaluation. Mention FOUR (4) questions that you may ask during this stage.

- _____
- _____
- _____
- _____

(1 mark x 4 = 4 marks)

10) Which is the best type of production for the following products, Mass, Batch or One off?

I)Car:_____

II) Bread:_____

III) Paint:_____

IV) Custom made bed: _____ (½ X 4 = 2 Marks)

Answer ALL questions from the following TWO sections.

SECTION B: RESISTANT MATERIALS **(Total Marks: 30)**

1. This question is about a tool which is used in the workshop.

_____

_____

_____

a) What is the name of the tool?_____ (1 mark)

b) The tool uses the lever principle to cut wires.

I) Label the Effort , Pivot and the Load on the diagram above.

(3 Marks)

II) What kind of lever is the tool above (Underline the correct one)

1st Class Lever, 2nd Class Lever 3rd Class Lever

(1 mark)

III) Mention another tool or object which acts on the same principle as the above tool.

_____ (1 mark)

c) What should be the property of the front part of the tool?

_____ (1 mark)

d) How is this property achieved using heat treatment.

_____

_____

(2 marks)

e) Mention another type of heat treatment state why it is used?

_____

_____

(2 marks)

f) The tool is made from carbon steel which is an alloy. What is an alloy?

_____

_____

(2 marks)

g) Mention one other alloy which is used and state the components of the alloy.

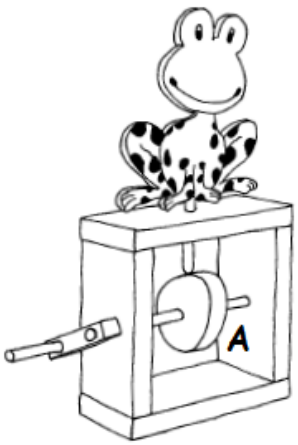
_____

_____

(1,1 marks)

2. This question is about mechanisms.

Paul is designing a toy which consists of a leaping frog. The user rotates a Crank and mechanism A moves the frog up and down.

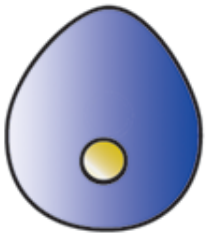


a) What is mechanism A called?

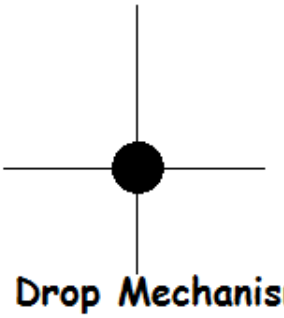
_____

(1 mark)

b) The current mechanism moves the frog up and down with uniform velocity. The mechanism is given in the adjacent figure. Paul wants his frog to rise steadily and then FALL. In the space provided draw the mechanism which allows the frog to FALL. (2 marks)



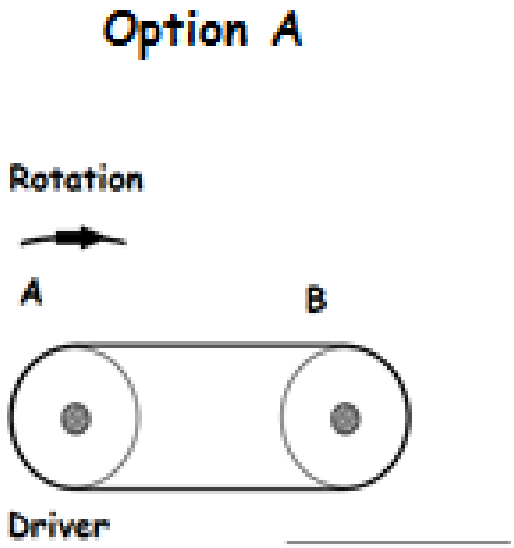
Pear shape.

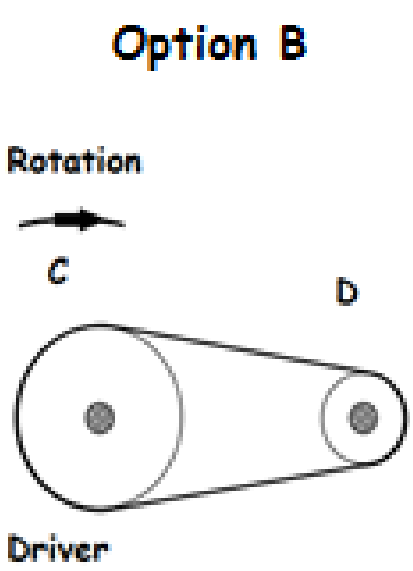


Drop Mechanism.

c) Paul wants to improve his design and his friend Peter suggested to include a motor and pulley system so the toy will be battery operated. Paul designed these two options A and B. The motor will be connected to the driver.

I) The mechanism will be connected to the other pulley which is called the _____ (1 mark)





II) Paul tried option A and the mechanism moved the same speed as the driver, why did this happen?

_____

_____

(2 marks)

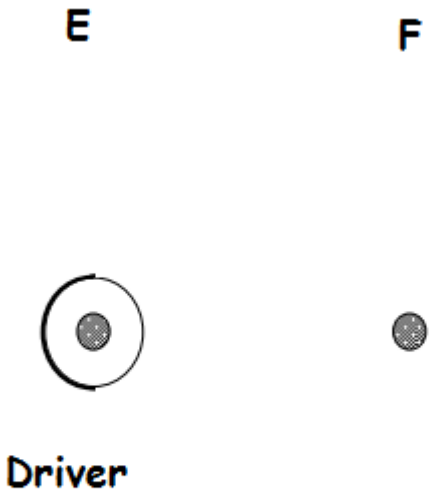
III) He tried option B but the output was too fast. Label the direction pulley D on the above figure.

(1 marks)

IV) Continue the following sentence on option B:

In option B the ratio is _____, so the speed is _____ whilst the force is _____. This is the same as the ___ th gear. (2 marks)

V) Paul noticed that the motor didn't have enough strength to turn the mechanism when using option B. In the following diagram draw the output pulley (F) and the belt which gives a low ratio with higher strength.

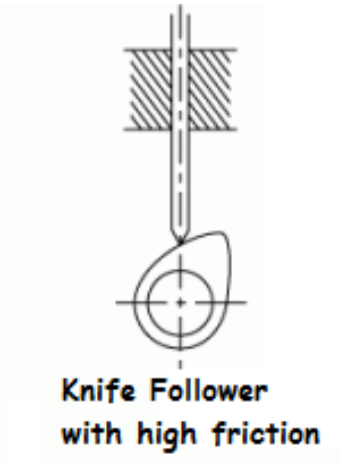


(2 marks)

VI) There was still a lot of friction in the mechanism since a knife edge follower was used. Mention one alteration which could be done to the follower to decrease the friction. Draw the follower in the following space.

_____

_____



(2,2 marks = 4 marks)

SECTION C: FOOD TECHNOLOGY **(Total Marks: 30)**

1) Read the situation below and answer the following questions.

Luke is a 12-year old student who moved with his parents from his birth country to live in Malta. He is very picky when choosing food and most of the time he never eats the food his mother prepares for him after school.

a) List **three (3)** factors which can affect Luke's food choice.

- _____
- _____
- _____

(1 mark x 3 = 3 marks)

b) Identify **three (3)** nutrients important for Luke's life stage and state the function of each.

Nutrient	Function
1.	
2.	
3.	

(1 mark x 6 = 6 marks)

c) Luke's favourite dish is deep-fried chicken burger with chips.

i) List **three (3)** reasons why we modify/ adapt recipes.

- _____
- _____
- _____ (1 mark x 3 = 3 marks)

ii) There are **three (3)** ways of adapting recipes. Mention these three ways.

- _____
- _____
- _____

(1 mark x 3 = 3 marks)

iii) Give **one (1)** healthy substitution to Luke's favourite dish.

- _____

(1 mark)

iv) Mention **one (1)** healthy cooking method which could be used for Luke's favourite dish.

- _____

(1 mark)

2) What is the difference between 'quality control' and 'quality assurance'?

_____

_____

(2 marks)

3) List the **three (3)** types of production and give ONE (1) example of each.

Production Method	Example

(½ mark x 6 = 3 marks)

4) Fill-in the following table with the correct words found hereunder.

Thickness	Fermentation	Glazed	Rennet
	Aeration	Binding	

Flour is used in soups or sauces to improve their _____.
_____ is used in cheese making.
_____ is a process used to produce wine, beer and yoghurts by the use of micro-organisms.
When sieving flour, _____ takes place to help ingredients trap air.
Pastry products are _____ by eggs or milk to create a brownish colour when food is baked.
_____ is the process of joining ingredients together.

(1/2 marks x 6 = 3 marks)

5) Today technology is taking its course in developing new packaging materials. Answer the following questions.

a) Mention **one (1)** packaging material suitable for hot-take away.

_____

(1 mark)

b) Give **one (1)** advantage and **one (1)** disadvantage of the material mentioned in the previous question.

- Advantage: _____
- Disadvantage: _____

(1 mark x 2 = 2 marks)

c) List **four (4)** examples of food labelling.

1.	2.
3.	4.

(1/2 mark x 2 = 2 marks)