

JUNIOR LYCEUM ANNUAL EXAMINATIONS 2007

Educational Assessment Unit – Education Division

FORM 3

DESIGN AND TECHNOLOGY

TIME: 1h 30 min

Name: _____

Class: _____

Answer **all questions of section A**, and all questions of **TWO** other sections of your choice.

**SECTION (A)
DESIGN PROCESS**

This section carries a total of 50 marks

1. Apart from the front cover and contents list, give eight more page titles or headings related to the design process that should be included in the design folio of a Design and Technology project.

4 marks

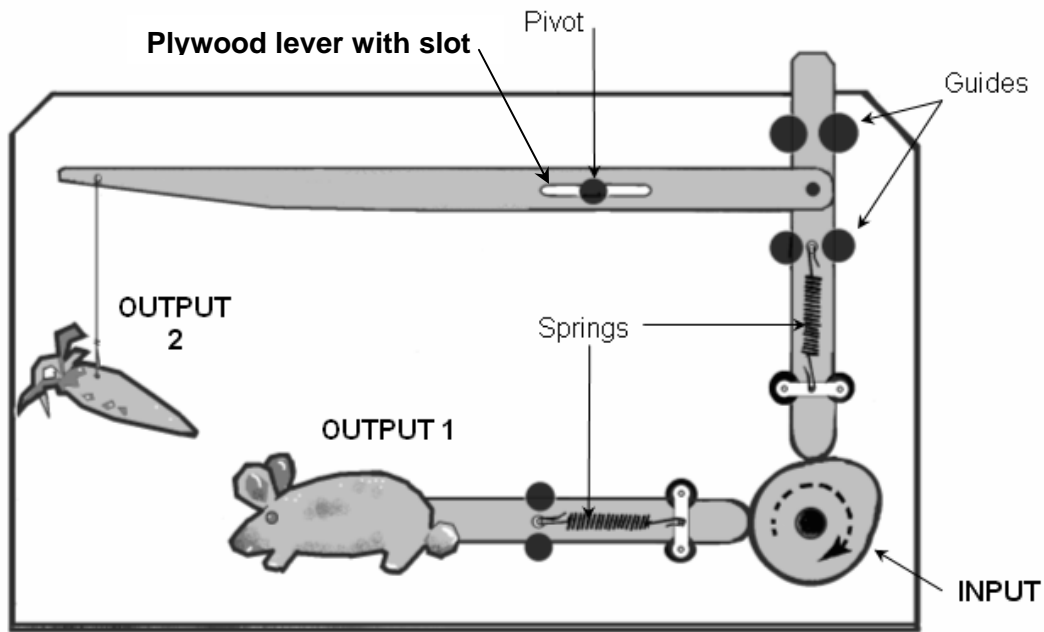
2. Various production methods are used for making products.
Which is the best method of production for making the following?

Mark your answer with a ✓ under the best method of production.

	One-off production	Batch Production	Mass or Continuous Production
A wedding dress			
<i>Ftajjar</i> in a local bakery			
Bottled soft drinks			
School magazine			

4 marks

3. You are asked to investigate the following idea for making a moving picture of a rabbit trying to steal a carrot.



- a. What type of mechanism is the input? _____ (1 mark)
- b. Is it turning clockwise or anti-clockwise? _____ (1 mark)
- c. Draw arrows on the picture to show the rabbit's movement after one complete turn of the input. (1 mark)
- d. Draw arrows on the picture to show the carrot's movement after one complete rotation of the output. (1 mark)
- e. Does the movement of the rabbit and the carrot change if the input is turned in an opposite direction? _____ (2 marks)
- f. Why are springs used in this moving picture?
 _____ (2 marks)
- g. In case of difficulty obtaining springs, what can be used instead?
 _____ (2 marks)
- h. Show by means of a sketch how movement can be doubled in one turn without changing the speed of rotation.
To help you out: by changing the shape of the component on the input side of the mechanism.
 (3 marks)
- i. The above moving picture has a possibility of another output. Mark it as OUTPUT 3 on the picture itself. (3 marks)

16 marks

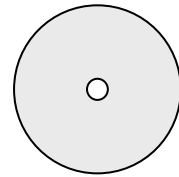
4. Look again at the picture shown in question 3.
Observe the plywood lever with the slot.

Finish off this work plan to explain briefly the making of the slot and the tools you would prepare.

WORK PLAN FOR MAKING SLOT IN LEVER	
Tasks	Tools needed
<i>1. Draw centre lines and slot on lever</i>	<i>Pencil and ruler</i>

10 marks

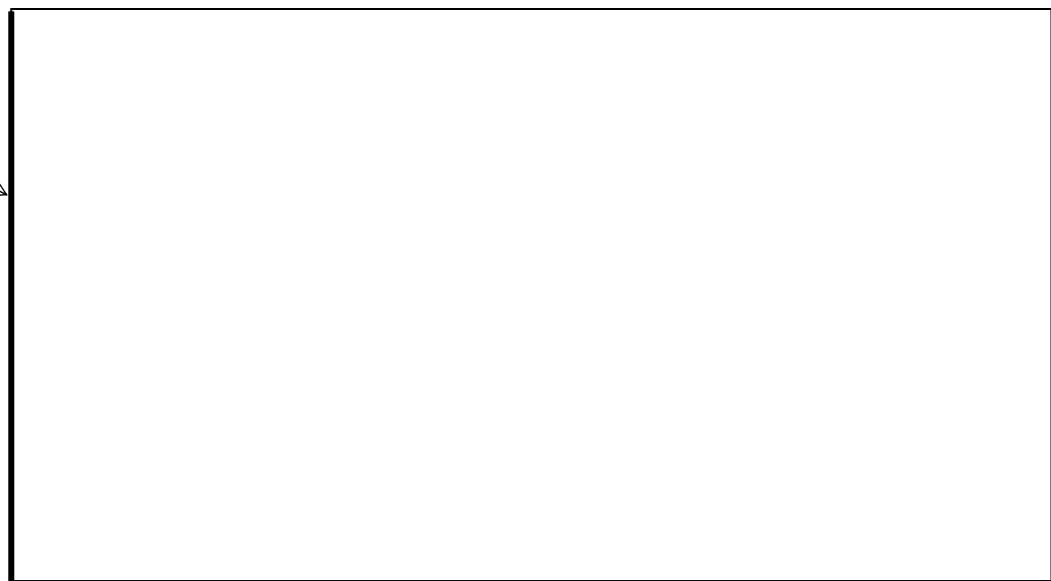
5. Correct marking out saves material, money and reduces waste.
You need to cut out TWO wheels similar to the pattern shown here.



Wheel pattern - Scale 1:1

Show by drawing how you would lay out the two wheels in such a way as to make efficient and economical use of the piece of Acrylic plastic whose size is shown below.

Actual size of acrylic sheet →



4 marks

6.

Read this Design Brief carefully, and then answer the questions that follow.

Design a bag to be given as a promotional gift to customers buying bread from a bakery called "OVEN FRESH" whose speciality is the making and selling of fresh fancy bread. Because of environmental issues the bakery requires that the bag must be made of a washable fabric and reusable. It must be suitable to carry two large loaves.

a. Write four design requirements you would include in the specification for the bag.

- i. _____
- ii. _____
- iii. _____
- iv. _____

4 marks

b. "OVEN FRESH" company requires a logo and a colour scheme for the bags.

Draw a suitable logo with the following specifications.

- The design must not have more than 2 colours to limit the printing cost.
- The colour of the material for the bags is dark brown.

8 marks

END OF SECTION (A)

SECTION (B)
RESISTANT MATERIALS

Total marks for this section: 25

1. Name **ONE** place where the following joints may be used.

PROCESS	USED
Pop riveting	
Bolt and nuts	
Welding	

3 marks

2. Give **ONE** reason why it is important to do marking out without wasting material.

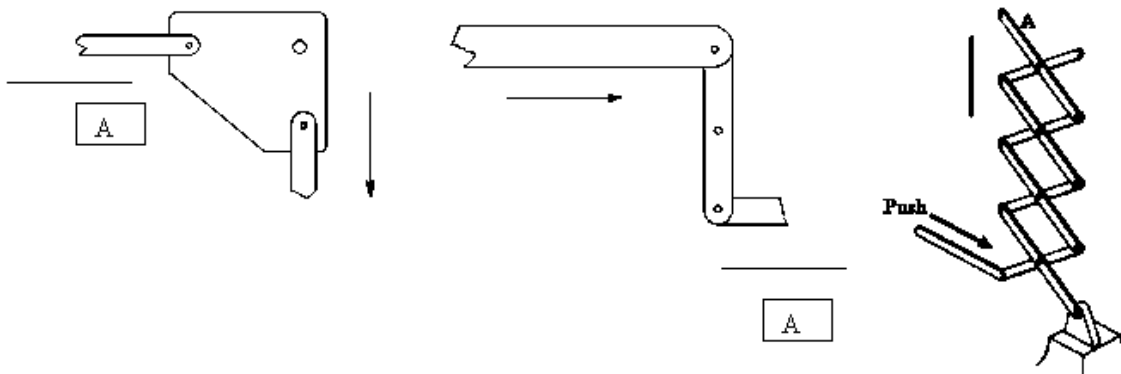
2 marks

3. Mention the proper marking out tools to be used to do the following job.

Job description	Tools used
Marking mitre joint on red deal.	
Marking a circle on a sheet of aluminium.	
Marking a centre line on a mild steel flat bar.	

3 marks

4. Show by means of an arrow the direction of movement of part 'A' in the following linkages.



3 marks

5. Write the type of adhesive that should be used for joining

MATERIAL	ADHESIVE
Red deal to mahogany	
Acrylic to acrylic	
Marine wood work	

3 marks

6. Name a suitable hand tool for doing the following tasks (jobs).

JOB DESCRIPTION	NAME OF HAND TOOL
Cutting a circular hole in MDF 6mm thick.	
Holding two pieces of wood together until glue sets.	
Cutting a strip from 0.3mm thick galvanised sheet.	

3 marks

7. Continue the following statements:

A twist drill is used to _____

A scribe is used to _____

A centre punch is used to _____

3 marks

8. State three precautions that should be observed when using a screwdriver.

i. _____

ii. _____

iii. _____

3 marks

9. Fill in the following statements:

a) Copper is an excellent _____ of heat and electricity.

b) Copper is drawn into wire because it is _____.

2 marks

END OF SECTION (B)

**SECTION (C)
ELECTRONICS**

Total marks for this section: 25

1. Calculate the total resistance shown below.



TOTAL RESISTANCE _____

4 marks

2. Use the following table to write the colours of the bands for these resistors.

COLOUR	1	2	ZEROS
BLACK	0	0	
BROWN	1	1	0
RED	2	2	0 0
ORANGE	3	3	0 0 0
YELLOW	4	4	0 0 0 0
GREEN	5	5	0 0 0 0 0
BLUE	6	6	0 0 0 0 0 0
VIOLET	7	7	0 0 0 0 0 0 0
GREY	8	8	0 0 0 0 0 0 0 0
WHITE	9	9	0 0 0 0 0 0 0 0 0

i 1000Ω _____

ii 550Ω _____

6 marks

3. What is the purpose of a silver or gold band on a resistor?

2 marks

4. Draw the symbol of NPN transistor showing and naming the three legs.

2 marks

5. a. Explain briefly how a NPN transistor works.

3 marks

b. Draw the symbol of a diode showing the anode and cathode sides.

2 marks

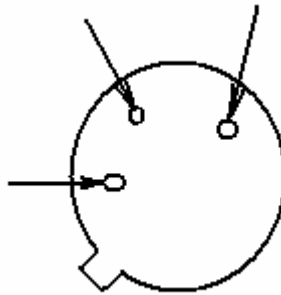
6. Give two precautions that should be taken before connecting a capacitor.

i. _____

ii. _____

4 marks

7. The following diagram shows a NPN transistor viewed from underneath. Indicate the collector, the emitter and the base.



2 marks

END OF SECTION (C)

**SECTION (D)
FOOD**

Total marks for this section: 25

1. All food contain different amounts of nutrients which all have different function. Say what is the function of:
- i. Carbohydrates _____
 - ii Protein: _____
 - iii Iron _____

3 marks

2. HACCP is a system used to ensure food safety.
Mention 3 stages that are applied during the HACCP process.
- i. _____
 - ii. _____
 - iii _____

6 marks

3. Most of the food we buy is packaged for various reasons.
- a. What is the purpose of food packaging? Mention 2 purposes.
- i. _____
 - ii. _____

2 marks

b. In the table below list **TWO** types of food packaging and give TWO properties of each.

Types of packaging	Two Properties of each
i. _____ <p style="text-align: right;">2 marks</p>	i. _____ ii. _____ <p style="text-align: right;">2 marks</p>
ii. _____ <p style="text-align: right;">2 marks</p>	i. _____ ii. _____ <p style="text-align: right;">2 marks</p>

4. Traditional biotechnology in food production has been in practice for long years.
 a. Mention **TWO** types of food that are produced through a traditional biotechnology method.

- i. _____
 - ii. _____
- 2 marks**

b. State **TWO** benefits of modern biotechnology.

- i. _____
 - ii. _____
- 4 marks**

END OF SECTION (D)

**SECTION (E)
TEXTILES**

Total marks for this section: 25

1. The passage below outlines why particular fabrics are used for certain types of clothes. Fill in correctly by using the following words: **warm; dyes; lustre; absorbent; cool.**

- i. Cotton is used for T-shirts because it is _____ to wear and _____ well.
- ii. Linen is used for tea-towels because it is very _____
- iii. Wool is used for jumpers because it is _____ to wear.
- iv. Silk is used for eveningwear because it has good _____ and drape.

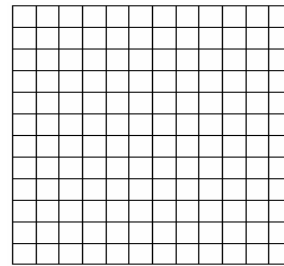
5 marks

2. What correct tool or equipment would you use to perform the following tasks?

Task	Tool / Equipment
Marking lines on fabric	_____
Cutting out a garment	_____
Press open a seam	_____
Hold two pieces of fabric for a while	_____
Making a permanent seam	_____

5 marks

3. a. Draw a twill weave on this diagram



4 marks

b. Give ONE reason why twill weave is often used for weaving jean fabric.

2 marks

4. a. What do you understand by one-way fabrics?

3 marks

b. Name TWO types of one-way fabrics

i. _____ ii. _____

2 marks

5. Tick the correct answer:

a. Nylon is a: Vegetable fibre
 Synthetic fibre
 Regenerated fibre

c A care label has: Cleaning instructions
 Price of the garment
 Picture of the garment

b. Shears is: Cutting out scissors
 Very light fabric
 Type of fastener

d Towels need to be: Transparent
 Stretchable
 Absorbent

4 marks

END OF SECTION (E)