

KULLEĠĠ SAN BENEDITTU

Boys' Secondary, Kirkop

Mark

HALF-YEARLY EXAMINATION – 2012/2013

Level 5-6-7-8

FORM 1

DESIGN AND
TECHNOLOGY

TIME: 1h 30min

Question	1	2	3	4	5	6	7	8	9	10	11	Global Mark
Max. Mark	3	17	10	6	2	2	3	25	13	11	6	100
Mark												

Instructions to students:

Answer ALL questions.

Good English and orderly presentation are important.

Read carefully each question

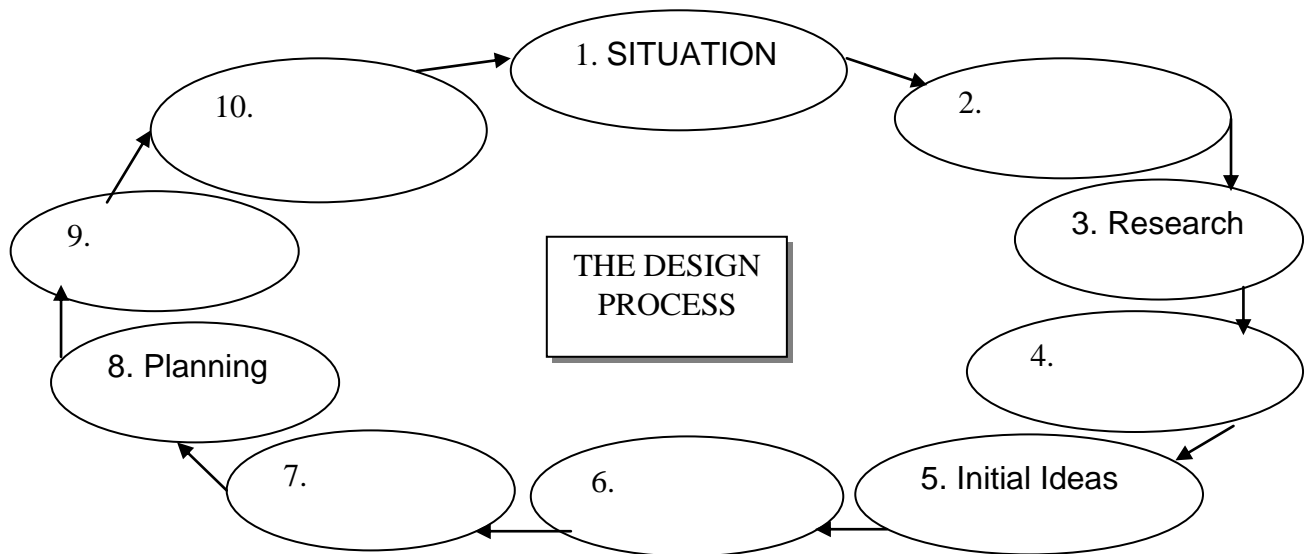
DO NOT WRITE ABOVE THIS LINE

Name: _____

Class: _____

1. Complete the missing stages of the Design Process. Choose from the following list of words:

Testing and Evaluation	Design Brief	Specifications
Development	Choosing best idea	Making



$\frac{1}{2}$ mark x 6 = 3 marks

2. Read the following statement and then answer the questions:

I will Design and Make a hand held lighting device (torch) that can be carried inside our pockets or as a key chain.

- a. What is this statement called? _____

1 mark

- b. Underline 2 keywords in the statement above.

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

- c. List 4 specifications that should be considered when designing this product:

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1mark x 4= 4 marks

- d. List 2 sources from where you can research information to design the product.

•

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

- e. Figure 1 shows a simple idea for the casing of the light device. The size of the casing are 60mm x 30mm. **Label the dimensions on the figure below:**

2 marks

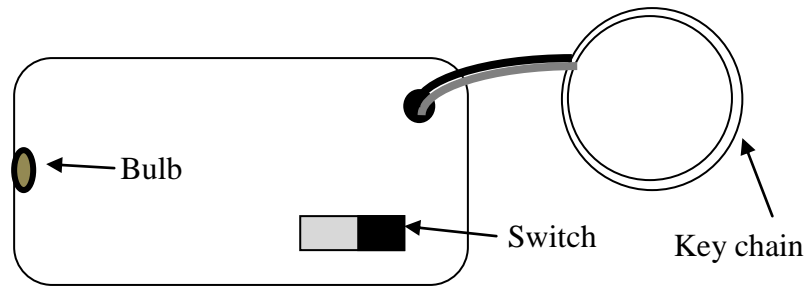


Figure 1

- f. **Sketch another 2 ideas** for the lighting device. Remember sketches must be **clear** enough and have an indication of **shape, sizes, materials, and any proposed decoration**. You are free to colour your sketches.

Idea 1

Idea 2

4 marks x 2 = 8 marks

3. The casing of the lighting device will be made out of thermoplastic.

a. What are Thermoplastics?

b. What are Thermosettings?

4 marks

c. Classify the following list of Plastics in their correct category:

Polypropylene, Polystyrene, GRP, PVC, Melamine formaldehyde, Acrylic

Thermoplastic	Thermosetting

6 marks

4. Acrylic is chosen as the material to make the lighting device.

a. Name 2 **properties** of Acrylic

•

•

1 mark x 2 = 2 marks

b. Name 2 advantages of using plastic rather than metal for the lighting device

•

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1 mark x 2 = 2 marks

c. What tool can I use to bend the shape of plastic?

2 marks

5. Figure 2 shows a 3V button cell that is chosen to light the bulb. Name one reason why a 3V button cell is used and not a PP3 battery.



Figure 2

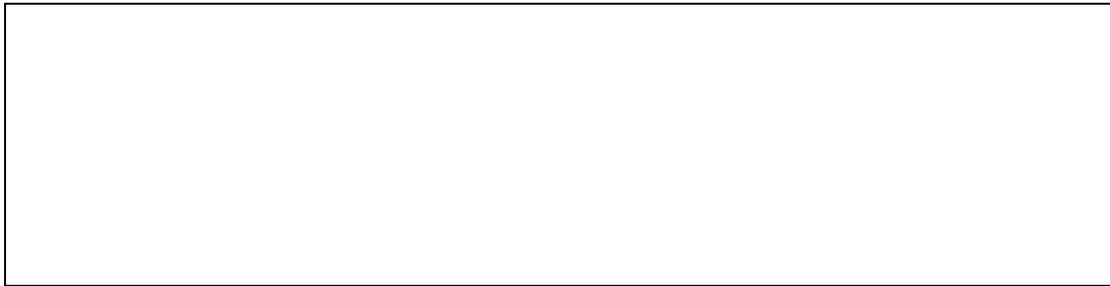
2 marks

6. A **slide switch** is used to switch on the bulb. Mark a circle round the slide switch from the pictures below:



2 marks

7. In the space below use electronic symbols to draw the electronic circuit for the lighting device using a **battery, switch and bulb**. **3 marks**



8. Figure 3 shows a bed side ornament that was created to give light during the night.

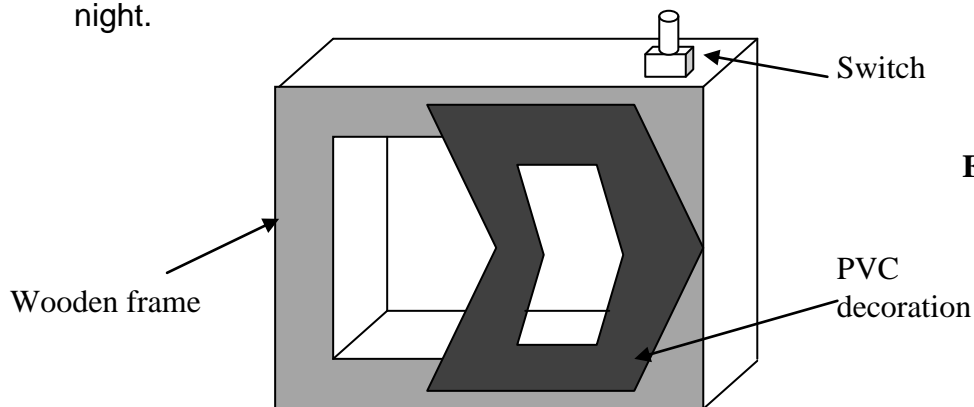


Figure 3

- a. The frame is made out of wood.
- i. What is the difference between softwood and hardwood?

4 marks

- ii. The first chosen material was Oak. Is oak a hardwood or a softwood?

1 mark

- iii. The designer decided to use MDF instead of oak. Name 1 advantage of using MDF instead of oak?

1 mark

- b. Name two possible **finishes** that can be applied on the wooden frame:

-
-

1 mark x 2 = 2 marks

c. What type of glue can I used to glue the MDF frame together?

2 marks

d. Name a joining method that fixes the PVC decoration to the wooden frame:

- i. Temporarily (can be removed) _____
- ii. Permanently (cannot be removed) _____

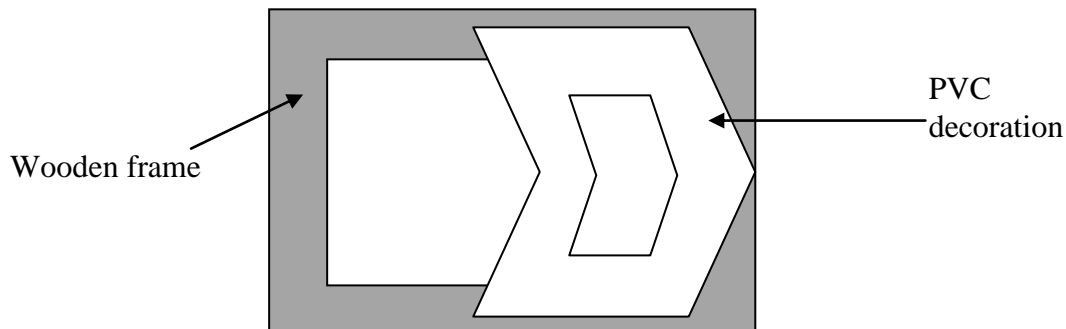
4 marks

e. Underline the correct answer in the brackets:

- i. To cut the wooden parts of the frame we use a (Tenon saw, coping saw, hack saw).
- ii. To drill a hole we use a (scriber, centre-punch, driller).
- iii. To smooth the edges of wood we use a (rasp, file, wire brush).
- iv. To mark lines at right angles with the datum edge we use a (try square, fret saw, hack saw)

4 marks

f. On the figure below show how the PVC decoration can be fixed to the wooden frame using **screws**. Label all parts.



3 marks

g. Name the following tools:



i.	ii.	iii.	iv.
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4 marks

9. This question is about electronic circuits

a. What is the voltage of ONE AA battery?

b. Calculate the total voltage when connecting **TWO** AA batteries in series

3 marks

Figure 4 shows the electronic components inside a bedside ornament that lights a bulb during the night.

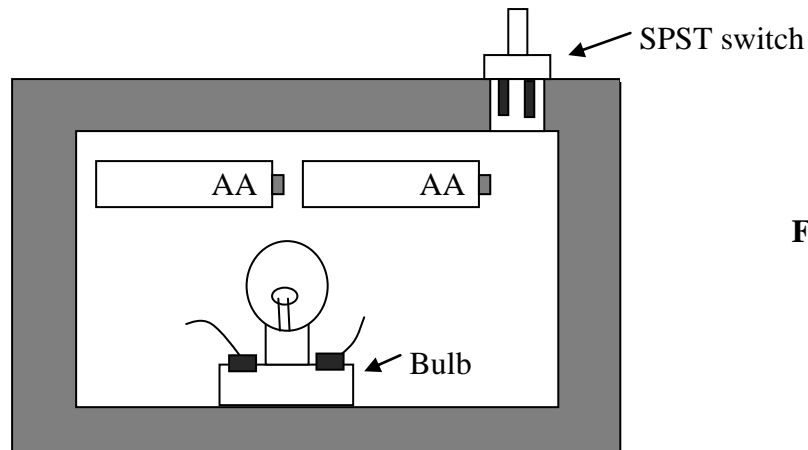


Figure 4

- c. Complete the figure above by drawing wires to show how the components can be wired together so that the bulb will light up when the switch is pressed.

4 marks.

- d. A SPST switch is used for the circuit.
What does SPST stand for?

2 marks

- e. Draw the symbol of a SPST switch

2 marks

- f. What would be the problem if I use a push to make (non-latching) switch for this circuit?

2 marks

10. This question is about batteries:

- a. Give the names of the following batteries: choose from the following list:

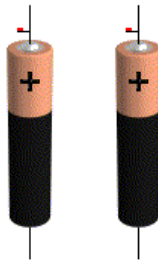
C	PP3	AAA	AA
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i.	ii.	iii.	iv.
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4 marks

b. Connect the two batteries shown below in series



4 marks

c. Draw the electronic symbol of a battery

1 marks

d. Use electronic symbols to draw 2 batteries connected in series



2 marks

11. This question is about safety in the lab.

a. What is the name of the safety equipment shown here?



1 mark

b. Give one reason why we should wear this safety equipment

2 marks

c. Name 3 safety measures we must observe in the design and technology labs

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3 marks

END OF EXAM