

# 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<br>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*

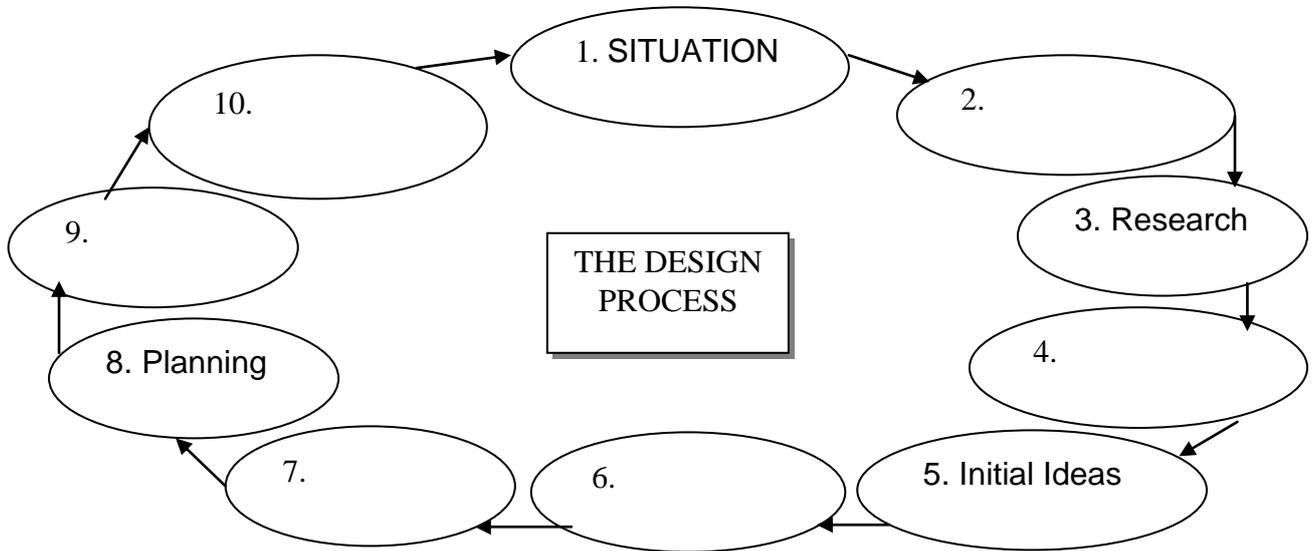
DO NOT WRITE ABOVE THIS LINE

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         |



**½ 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.

**½ 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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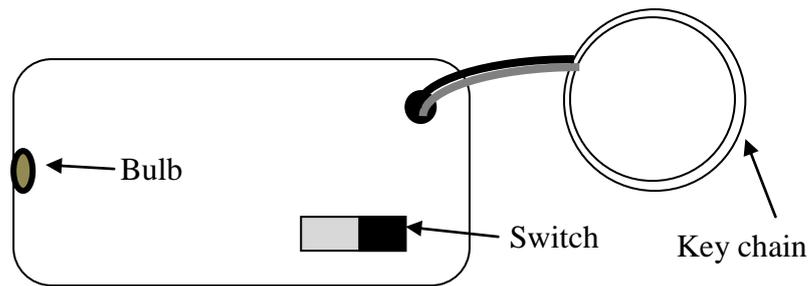
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**½ mark x 2 = 1 mark**

- 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

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\_\_\_\_\_

•

\_\_\_\_\_

**1 mark x 2 = 2 marks**

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

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\_\_\_\_\_

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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**

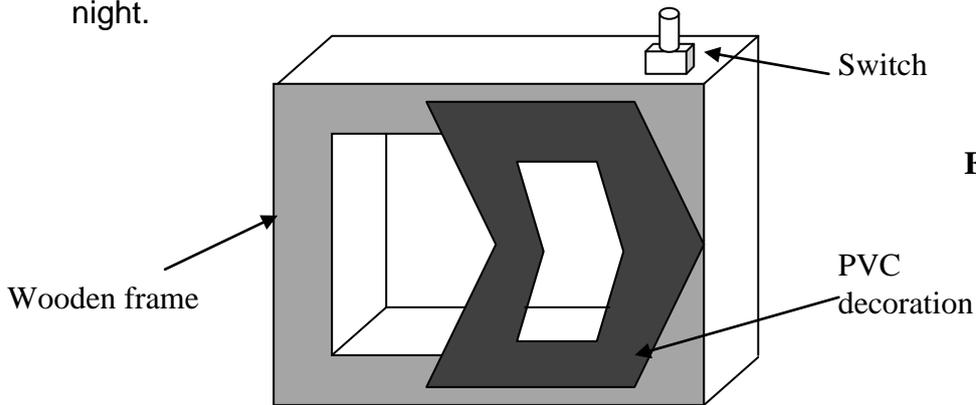
6. A **slide switch** is used to switch on the bulb. Mark a circle round the slide switch from the pictures below:



**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?

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**4 marks**

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

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**1 mark**

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

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**1 mark**

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

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- 

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**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).

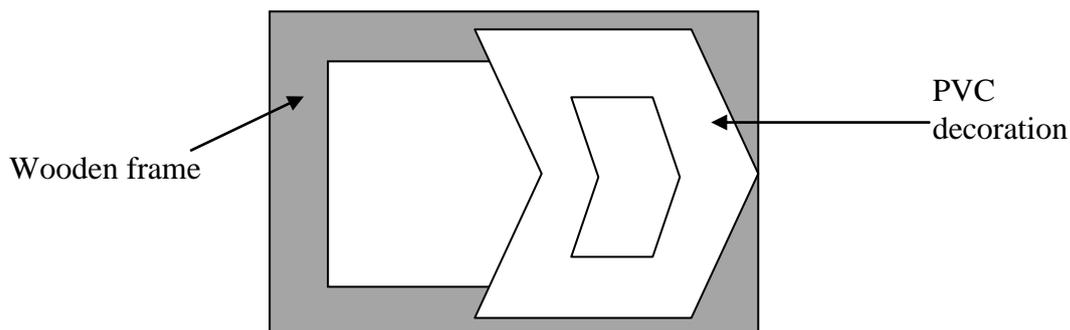
ii. To drill a hole we use a (scriber, centre-punch, driller).

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. |
|----|-----|------|-----|

**4 marks**

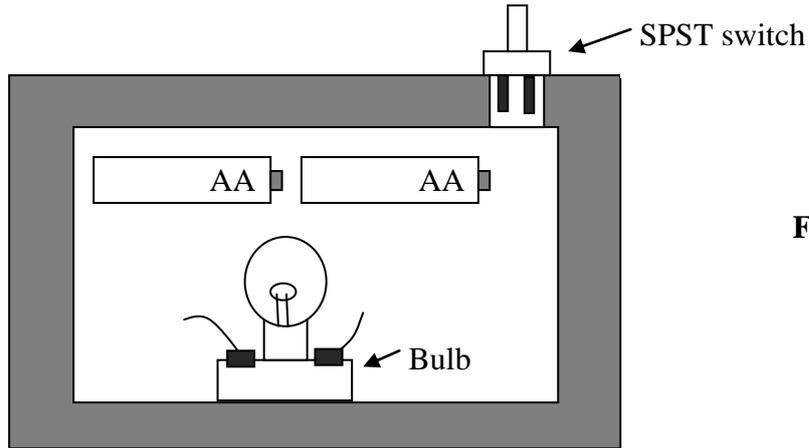
9. This question is about electronic circuits

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?

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**2 marks**

e. Draw the symbol of a SPST switch

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**2 marks**

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

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**2 marks**

10. This question is about batteries:

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

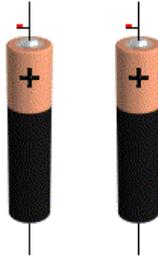
|          |            |            |           |
|----------|------------|------------|-----------|
| <b>C</b> | <b>PP3</b> | <b>AAA</b> | <b>AA</b> |
|----------|------------|------------|-----------|



|           |            |             |            |
|-----------|------------|-------------|------------|
| <b>i.</b> | <b>ii.</b> | <b>iii.</b> | <b>iv.</b> |
|-----------|------------|-------------|------------|

**4 marks**

b. Connect the two batteries shown below in series

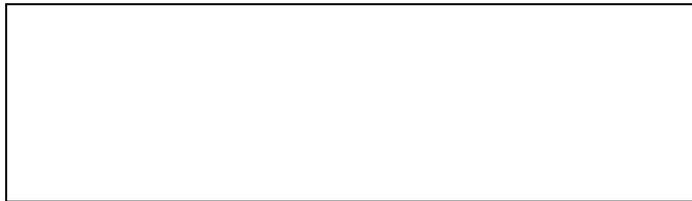


4 marks

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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\_\_\_\_\_

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\_\_\_\_\_

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\_\_\_\_\_ 3 marks

**END OF EXAM**