

JUNIOR LYCEUM & SECONDARY SCHOOL ANNUAL EXAMINATIONS 2007

Educational Assessment Unit – Education Division

FORM 5

DESIGN AND TECHNOLOGY

TIME: 1h 30min

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

Study carefully this design brief, and then answer the questions that follow.

Design Brief: Design a lunch box for primary school children.
The lunch box must be re-usable.

1. Who are the target users of the lunch box? _____

1 mark

2. Is the lunch box intended only for boys, only for girls, or for both boys and girls?

1 mark

3. a. State two persons who usually need to prepare a school lunch.

i. _____ ii. _____

2 marks

b. Write two questions you would ask them when making research on lunch boxes.

i. _____

ii. _____

2 marks

4. a. State two AESTHETIC issues that must be considered when designing the lunch box for primary school children.

i. _____

ii. _____

2 marks

b. State two ENVIRONMENTAL issues that must be considered when designing the lunch box for primary school children.

i. _____

ii. _____

2 marks

5. Write four design requirements you would include as specifications of the lunch box for primary school children.

i. _____

ii. _____

iii. _____

iv. _____

4 marks

6. Give two properties the materials for the lunch box need to have.

i. _____

ii. _____

2 marks

7. Sketch **ONE** idea of a lunch box holding two sandwiches for 8-year-old girls attending primary school.

You should give an indication of approximate sizes, materials and notes to improve your communication. *You may use colour to enhance your idea.*

12 marks

8. State when or where each of the following sources can be used in your design folio.

a. The Internet:

b. Word processing computer programme:

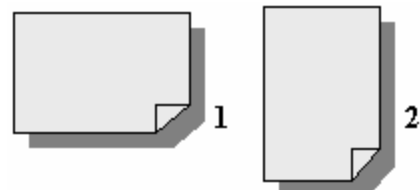
c. Computer graphics programme:

d. Scanner

4 marks

9. a. How many A4 sized papers can you get from one A3 sheet paper? _____

b. Pictures 1 and 2 show two sheets of paper:



i. Which paper is LANDSCAPE oriented? _____

ii. Which paper is PORTRAIT oriented? _____

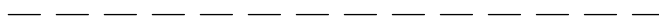
3 marks

10. Several types of lines and symbols are used when preparing working drawings.

a. What does a thin, long chain line like the one below, represent when used in a working drawing?



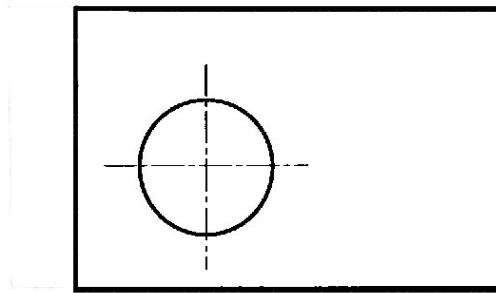
b. What does a thin, dashed line like the one below, represent when used in a working drawing?



c. What does SCALE OF DRAWING IS 1:1 mean?

3 marks

11. Measure and dimension in mm the drawing shown below to BSI standards.



8 marks

12. Give a reason to show how (a) the manufacturer and (b) the consumer benefits from BATCH PRODUCTION of products.

Manufacturer: _____

Consumer: _____

4 marks

END OF SECTION (A)

**SECTION (B)
ELECTRONICS**

Total marks for this section: 25

1. Write three safety precautions that should be observed when soldering an electronic component on a veroboard.


i. _____

ii. _____

iii. _____

3 marks

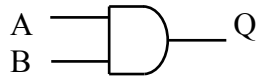
2. Name the following gates:

i.  _____

ii.  _____

4 marks

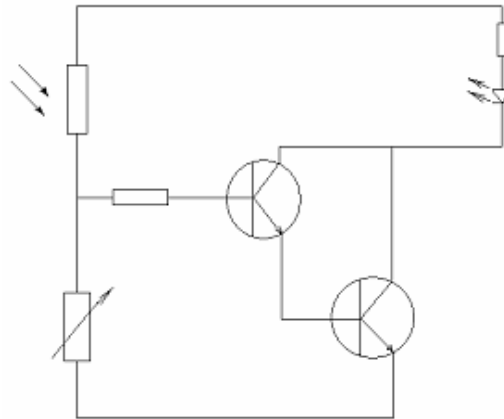
3. Write the truth table of this gate.



A	B	Q

2 marks

4. Mark and label each section, indicating input – process - output of the circuit shown below.



2 marks

5. Use symbols to draw the reversing circuit of a DC motor controlled by means of a DPDT relay. Include the required switching.

6 marks

6. Given the following components draw a circuit diagram to light an LED controlled by temperature. Remember that you have to use symbols for the diagram.

- 9V Battery
- LED
- BFY50 Transistor
- 9V Relay coil SPDT
- Thermistor
- 2k Ω Fixed resistor
- 450 Ω Fixed resistor
- 100 k Ω Variable resistor
- Diode

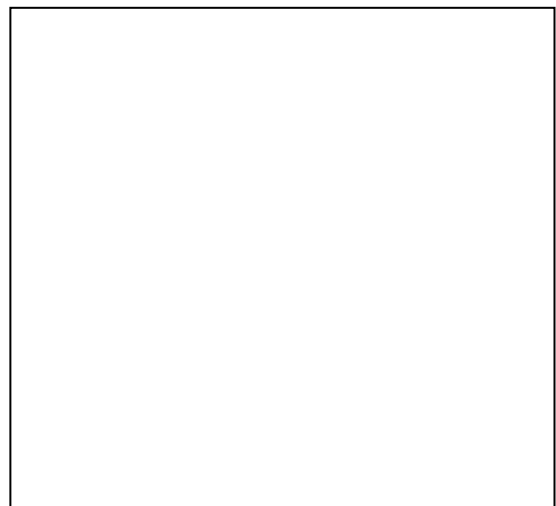
4 marks

7. By means of sketches show how a multimeter is connected to measure:

a. Resistance of a fixed resistor.



b. Current passing through a buzzer which is in series with a transistor.



4 marks

END OF SECTION (B)

SECTION (C)
Resistant Materials

Total marks for this section: 25

1. Name the proper tool to measure the following:

- a. A 20mm diameter shaft. _____
- b. the length of a red deal plank. _____ **2 marks**
-

2. Name the machine required for:

- a. cutting a circular shape in wood. _____
- b. drilling a hole in mild steel _____ **2 marks**
-

3. Write where each material below can be used and give **one** reason for your choice.

MATERIAL	USE	REASON
<i>Example: MDF</i>	<i>Bedroom Furniture</i>	<i>Good surface finish</i>
G.R.P. (Glass Reinforced Plastic)		
Cast Iron		
Pine boards		
PVC		

4 marks

4. Mark with a ✓ the type of steel from which the following tools are made.

TOOLS	Stainless steel	High speed steel	Cast iron	Alloy steel
Twist drill				
Engineering Vice				
Spanner				
Steel ruler				

4 marks

5. Classify the following metals under the correct heading:

- Aluminium
- Brass
- Mild Steel
- Copper
- High Speed Steel.

FERROUS

NON-FERROUS

5 marks

6. Write the following under the correct heading.

- Welding
- Bolts and Nuts
- Split pin
- Adhesive

PERMANENT JOINTS

TEMPORARY JOINTS

4 marks

7. Match the following mechanisms to their correct statement by using straight lines.

CAMS

Teeth should be in mesh for transmission

LINKAGES

Need a belt to transmit motion

PULLEYS

Change a movement from rotational to linear

GEAR WHEELS

Pivoted levers working together

4 marks

END OF SECTION (C)

SECTION (D)
FOOD

Total marks for this section: 25

1. What factors affect people when making their choice of food? Mention **4** of these factors.

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

4 marks

2. Binding, coating and flavouring are 3 functions that some food ingredients have. Give 2 examples of each.

Binding	Coating	Flavouring

6 marks

3. **HACCP** is a quality assurance system used in food manufacturing. What does it stand for?

_____ **3 marks**

4. Give **three** reasons that explain why food preservation is made.

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

6 marks

5. What is the difference between high risk and low risk foods? Give examples of each.

High risk foods: _____

_____ **2 marks**

Example: _____ **1 mark**

Low risk foods: _____

_____ **2 marks**

Example: _____ **1 mark**

END OF SECTION (D)

SECTION (E)
TEXTILES

Total marks for this section: 25

1. Look at this picture. State what properties are needed for the garment the person is wearing. Mention 2 properties only.

- i. _____
ii. _____



4 marks

2. What is the difference between aesthetic properties and functional properties of fabric?

6 marks

3. Carding, spinning, bale opening, drawing, and combing are different stages in turning cotton fibres into yarn. Put these stages in correct order.

1. _____
2. _____
3. _____
4. _____
5. _____

5 marks

4. Copy any four (4) of these care labelling symbols and explain their meaning.



Symbol	Meaning

4 marks

5. Mention **3** different decorative components that you can use to decorate textile items. Suggest one suitable garment or textile item where each component can be applied on.

	DECORATIVE COMPONENT	GARMENT OR TEXTILE ITEM
i.	_____	_____
ii.	_____	_____
iii.	_____	_____

3, 3 marks

END OF SECTION (D)
