DIRECTORATE FOR QUALITY AND STANDARDS IN EDUCATION
Department for Curriculum Management and eLearning
Educational Assessment Unit
Annual Examinations for Secondary Schools 2011

Tra

FORM 3 (year 1) **DESIGN & TECHNOLOGY** **TIME: 1h 30min**

Name: _____ Class: _____ Set: _____

---------- Note to student: ----------
You are required to answer all questions

	Areas corrected					Marks for Written Exam.	Marks for Design Folio	TOTAL	**FINAL MARK**
	D	**RM**	**E**	**T**	**F**				
Max. Marks	20	20	20	20	20	100	100	200	**%**
Student's mark									

FOR TEACHERS' USE ONLY DISTRIBUTION OF MARKS

Enter student's mark obtained in every area of study in the above table.
D for Design, **RM** for Resistant Materials, **E** for Electronics, **T** for Textiles technology and **F** for Food technology

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SECTION A: **DESIGN**

Read carefully the situation given below before answering questions 1 to 5.

SITUATION:
When students go for an educational outing they do not bring their usual school bag. The school wishes that all students will be identified not only by their uniform but also by the bag that they are carrying. The school has asked you to design a student's bag to be used during school outings.

1. What problem is being presented in the above situation?

_____

_____

_____

_____

2 marks

2. Write down a Design Brief for the given situation.

_____

_____

_____

_____

3 marks

3. For your design ideas to be satisfactory and acceptable, first you need to do research. You therefore decided to conduct some interviews related to the above situation.

a. Write down THREE questions you would ask to students.

_____

_____

_____

_____

_____

1 mark x 3 = 3 marks

b. Write down THREE questions you would ask to the Head of school.

_____

_____

_____

_____

_____

1 mark x 3 = 3 marks

4. In the space below, sketch ONE idea for your design brief. Add notes, overall dimensions and colour to your sketch.

9 marks

SECTION B: **RESISTANT MATERIALS**

5. Figure A shows a set of outdoor table and benches. The frames are made of steel, wh
tops are made of mahogany.

Figure A

a. Complete the following by underlining the correct word or phrase in the brackets.

- Mahogany is a reddish-brown (softwood / hardwood / manufactured board) that can be used for outdoor furniture because it is durable.
- Steel is a (ferrous / non-ferrous) alloy made from a mixture of (aluminium and carbon / zinc and carbon / iron and carbon). The higher the carbon content, the (tougher / harder / heavier) is the steel.

½ mark × 4 = 2 marks

b. Name ONE suitable finish for the mahogany tops.

_____

_____

1 mark

c. Name ONE suitable finish for the steel frames.

_____

1 mark

d. Name ONE method used to join the wooden tops to the metal frames.

_____

1 mark

6. Complete the following table by drawing the appropriate standard form in oblique view.

Standard Form	Sketch
square hollow section	
tube	
round bar	

1 mark × 3 = 3 marks

7. The pair of scissors shown in Figure B is being used to cut out a piece of THIN tracing paper.

a. On Figure B, label the input and output of the scissors mechanism. Also add arrows to explain the direction of movement.

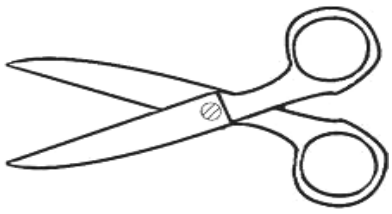


Figure B

1 mark × 4 = 4 marks

b. The same scissors will now be used to cut a piece of THICK cardboard. How will this effect the input force?

_____

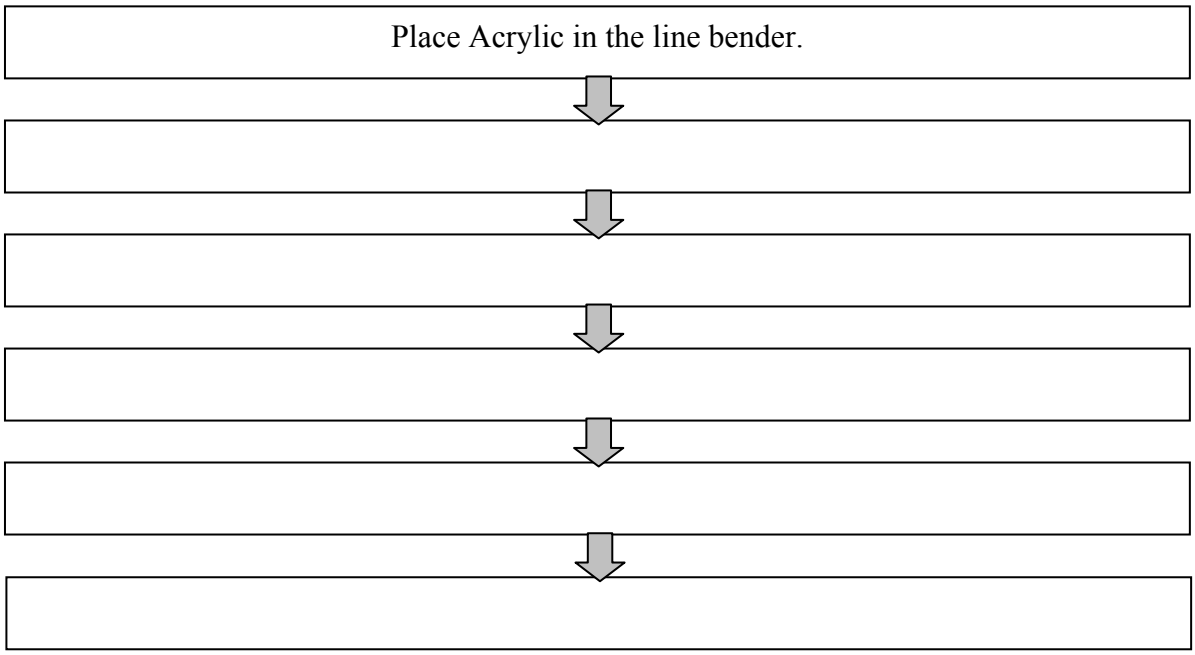
1 mark × 2 = 2marks

8. A student needs to use the plastic line bender in order to bend a piece of 3mm Acrylic a
angle.

a. The following sentences explain the steps involved when using the plastic line bender. The
steps are not in a correct sequence.

- Bend Acrylic and let it cool down.
- Switch off the heating element.
- ~~Place Acrylic in the line bender.~~
- Switch on the heating element.
- Align the line of bend over the heating strip.
- Wait until the Acrylic becomes soft enough.

Put the above sentences in the correct sequence to form a proper work plan. The first step is given.



1 mark × 4 = 4 marks

b. Mention TWO safety precautions which must be taken when using the line bender.

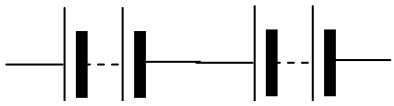
_____

_____

2 marks

SECTION C: **ELECTRONICS**

9. To power her environmentally friendly project, Anne needs two AA (1.5V) batteries connected in series.



(Circuit diagram of batteries in series)

Figure C

a. For Anne's project to remain environmentally friendly, does she need to use PRIMARY or SECONDARY batteries? Give ONE reason.

Type of battery: _____

Reason: _____

1 mark × 2 = 2 marks

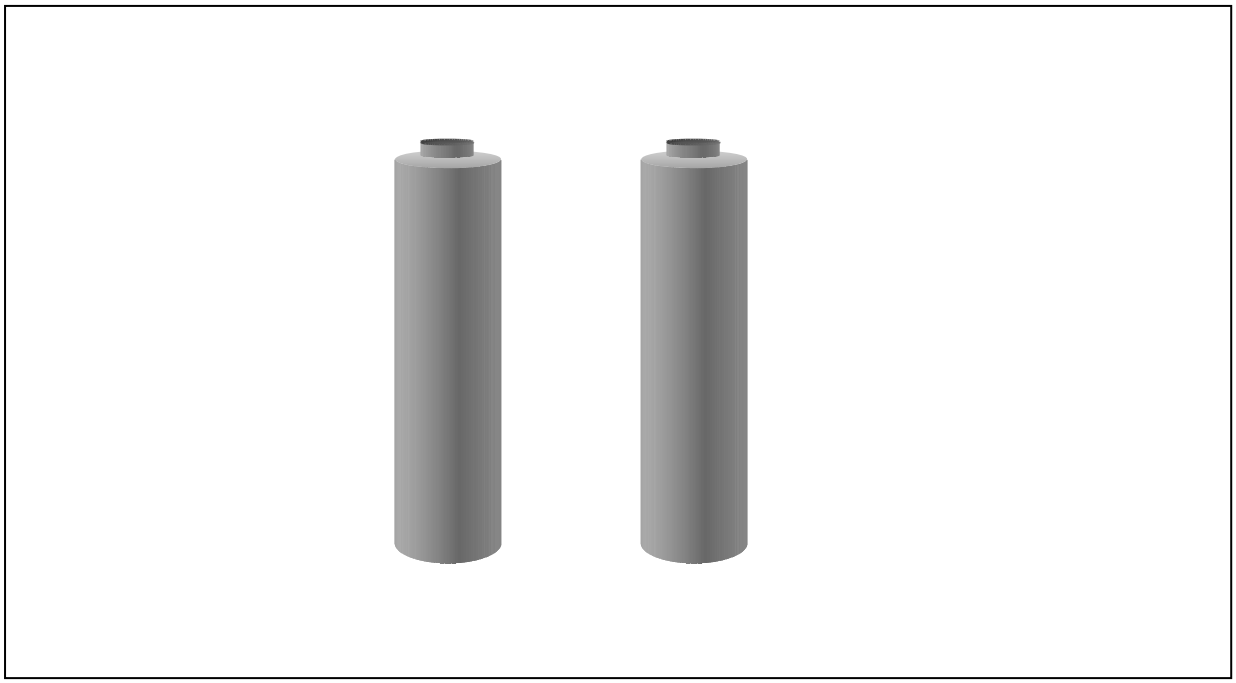
b. Calculate the total voltage of the two 1.5V batteries connected in series. Show ALL working.

_____

_____

2 marks

c. In the space provided below complete the diagram to show the wiring of the two AA batteries connected in series.



10. A Design and Technology student designed an electronic circuit so that when the temper[illegible] rises above 28ºC a DC motor rotates. From his research, the student found that a Darling[illegible] pair is needed to amplify the input current so that a 6V relay switch could be energized, hence the DC motor will rotate. Figure F shows the electronic circuit diagram of the student without the Darlington pair.

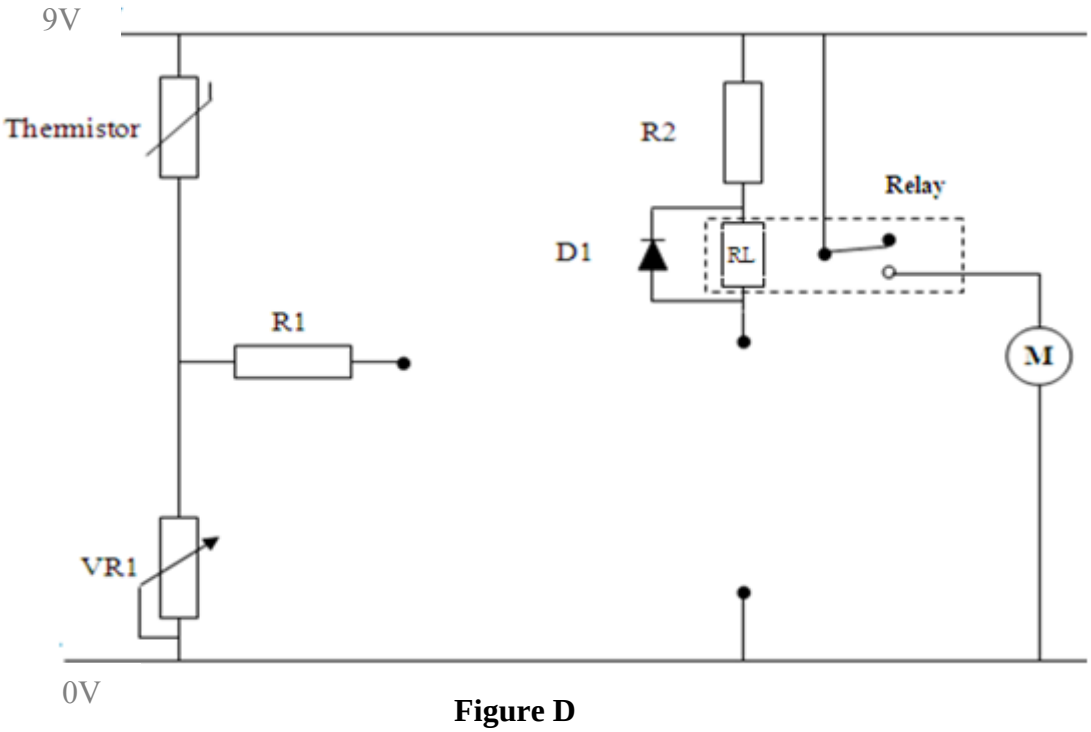


Figure D

a. Complete the electronic circuit diagram shown in Figure D to show how the Darlington pair is to be connected.

1 mark

b. Why did the student connect a resistor in series with the relay switch?

_____

_____

1 mark

c. On the circuit shown in Figure D draw an SPST type switch, so that the student could switch the given circuit ON and OFF.

1 mark

d. Underline ONLY the correct statement.

i. The diode in the above electronic circuit is used to protect the transistor from the back E.M.F.

ii. The diode in the above circuit is used to switch ON the relay switch.

11. Figure E shows the symbol of an electronic component.

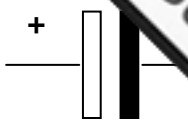


Figure E

a. What component is shown in Figure E? _____

1 mark

b. Mention ONE use why the component shown in Figure E is used in electronic circuits.

_____

1 mark

c. State TWO precautions that should be observed when using the component shown in Figure E.

_____

_____

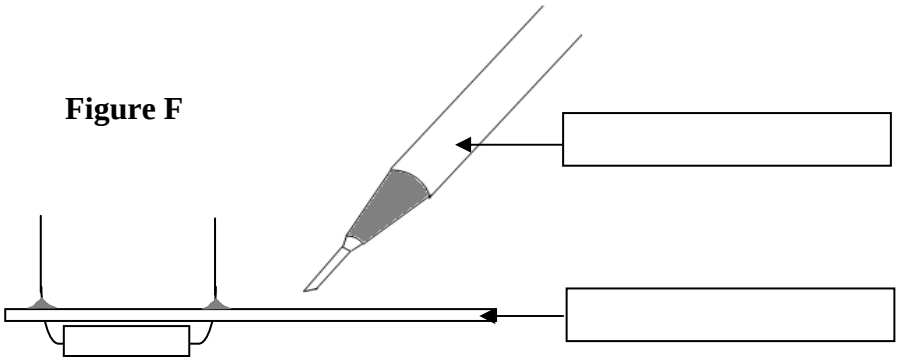
2 marks

d. Mention ONE type on a non-polarized capacitor._____

1 mark

12. Figure F shows an electronic component being assembled for a Design and Technology project.

Figure F



a. In the spaces provided in Figure F, label the diagram accordingly. **2 marks**

b. What tool is used to cut the excess legs of the component?

_____

1 mark

c. Mention TWO safety precautions that should be followed during soldering.

_____

_____

½ mark × 2 = 1 mark

d. Is soft solder a conductive or an isolative material?

SECTION D: **FOOD**

13. Match the following to form a complete correct sentence

a	Fat provides us with…		can lead to obesity.
b	Proteins are needed…		haemoglobin and avoid anaemia.
c	Iron helps produce…		energy and warmth.
d	High consumption of sugar…		digesting food and healthy intestines.
e	Fibre is needed for…		for growth, healing and energy.

1 mark x 5 = 5 marks

14. Give TWO examples of foods containing fats from each of the following sources.

a. Animal sources: _____, _____

b. Vegetable sources: _____, _____

1 mark x 4 = 4 marks

15. State whether the following statements are true or false.

a	Raw, cooked and ready-to-eat food should be stored together.	
b	The fridge should operate between 5^0C and 0^0C.	
c	Never put hot food in the fridge.	
d	Food should be frozen at 0^0C.	
e	Food is placed in the fridge to slow the growth of micro-organisms.	

1 mark x 5 = 5 marks

16. Fill in with appropriate words to explain the process.

▪ bacteria ▪ ferment ▪ biotechnological

a. Yoghurt is produced by a _____ process.

b. The starter culture in this process is _____ from live yoghurt.

c. Bacteria _____ the milk and turn it into yoghurt.

1 mark x

17. Mark with a ✓ to show whether the following words are classified as input, process, or o
The first one has been done for you.

	INPUT	PROCESS	OUTPUT
Roasting		✓	
Sugar			
Cheesecakes			
Lasagne			
Frying			
Boiling			
Eggs			

½ mark x 6 = 3 marks

SECTION E: **TEXTILES**

18. Figure G shows the weave of a piece of fabric. Name the weave used to construct the fabric shown.

_____

2 marks

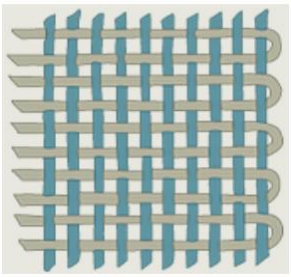


Figure G

19. Say whether the following statements are true or false.

		TRUE or FALSE
a	The origin of synthetic fibres is plants.	
b	Elastane fibre is suitable for the manufacture of bathing suit material.	
c	Fabric made from Lycra fibre is suitable for the manufacture of towels.	
d	The most important property for the fabric of a raincoat is colour.	
e	Cotton is suitable for the manufacture of shower robes.	

1 mark x 5 = 5 marks

20. Figure H shows the weave of a piece of fabric. Use the following words to fill in the blank boxes in Figure H.

- BIAS
- WEFT
- WARP
- SELVEDGE

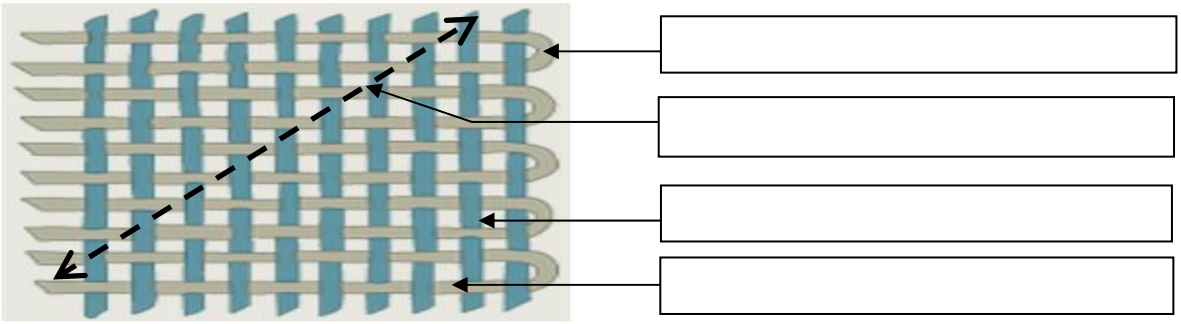


Figure H

1 mark x 4 = 4 marks

21. Figure I shows two darts on a piece of fabric. State why darts like these are used in a textiles product.

Figure I

_____

2 marks

22. State what temperature setting the following ironing symbols indicate. State a type of fabric suitable for each ironing symbol. The answer for the first symbol has been done for you.

Ironing symbol	Iron temperature	Suitable to iron:
	Low	Synthetics
		
		

1 mark x 4 = 4 marks

23. State a hazard *(a danger)* associated with each of the following tasks:

a. Using buttons for small children's clothes:

_____

b. Using a steam iron:

_____

c. Using a sewing machine:

1 mark x 3 = 3