JUNIOR LYCEUM AND SECONDARY SCHOOL
ANNUAL EXAMINATIONS 2011
Directorate for Quality and Standards in Education
Educational Assessment Unit

FORM 5 **DESIGN & TECHNOLOGY** **TIME: 1h 45min**

Name: _____ Form: _____ 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

SECTION A: **DESIGN** 2

IMPORTANT: FIRST READ THE FOLLOWING SITUATION CAREFULLY.

SITUATION

'College Catering' is the name of a new catering company that will be providing food, in all college tuck shops around Malta. Secondary school students, between 11 and 16 years old will be using these tuck shops.
'College Catering' wishes to create a brand that students will become familiar with and is therefore asking you to design one of the following products for them.

Choose ONE product from the following list before answering questions 1 to 7.
UNDERLINE YOUR CHOICE.

- A TEXTILES TABLE CLOTH
- A HEALTHY SNACK
- AN ELECTRONIC MENU BOARD WHICH CAN BE FIXED AGAINST A WALL
- A PROMOTIONAL KEY CHAIN TO BE GIVEN FOR FREE TO STUDENTS USING THE SCHOOL TUCK SHOPS

1. Give TWO design specifications that you would consider important for your chosen product.

i. _____

ii _____

1 mark x 2 = 2marks

2. Sketch ONE idea for your chosen product. Add notes, dimensions and colour to the sketch.

8 marks

3. Which is the most suitable method of production for making your product? Give ONE

Method of production: _____

Reason: _____

_____

1 mark for correct production method and 2 marks for reason = 3 marks

4. It is important that you would plan ahead before starting work on your final product. Prepare a short work plan for making the product you sketched in question 2.

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

_____

5 marks

5. Give TWO reasons why the results from the final testing of your product are useful for making a better product.

i. _____

ii _____

1 mark x 2 = 2 marks

6. **Figure A** shows one of the machines that can be found in a resistant materials workshop.

Figure A

a) Give the name of the machine shown in **Figure A.:** _____

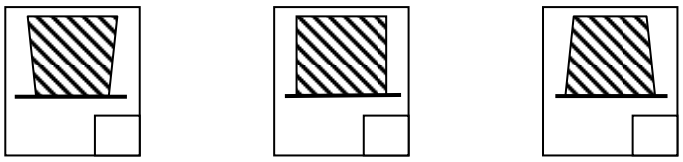
1 mark

b) Put the following steps in the correct order so as to obtain a work plan which explains how the machine in **Figure A** is used. The first step is given.

STEP	ORDER
Cool the plastic and remove mould.	
Place the mould on the moving bed.	**1**
Position the heater above the plastic to start heating.	
Clamp the plastic sheet and set timer.	
Remove heater, lift the mould into the plastic and switch on vacuum pump.	

1 mark × 4 = 4 marks

c) Tick the box which shows the most suitable cross section of a mould for the process described in question **6b.** Give a reason for your answer.



1 mark

Reason: _____

2 marks

d) State ONE safety precaution which should be observed when using the machine s
Figure A.

_____

1 ma

7. Complete the following table.

PROPERTIES OF METALS		
PROPERTY	DESCRIPTION of PROPERTY	EXAMPLE
Ductility	The ability of a material to be stretched into wire	Copper
	The ability of a material to conduct heat	
	The ability of a material to return to its original shape after a force applied on it is removed.	Spring steel
Hardness		

1 mark × 5 = 5 marks

8. **Figure B** shows the initial idea for a mechanical toy in which the character moves both arms up and down together in order to hit the drum.

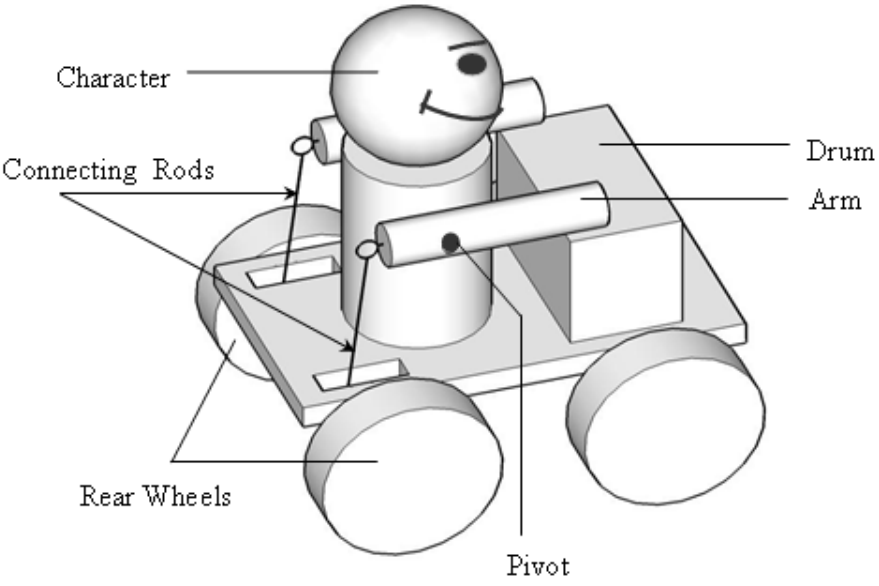


Figure B

a) Give the name of the shaft which is used to join the rear wheels with the connecting rods.

_____

1 mark

b) Draw the possible shape of the rear shaft in order to make the mechanism work. C
indicate where the connecting rods are to be placed.

2 marks

c) The design of the rear shaft was improved so that the character's hands can hit the drum one after the other. Sketch the new shape of the rear shaft, including the position of the connecting rods.

3 marks

SECTION C: **ELECTRONICS** 20 marks

9. a) What is the use of a bread board in electronics?

_____

1 mark

b) What tool is used to solder electronic components on a Vero board?

_____

1 mark

c) Mention TWO safety rules that should be observed when soldering electronic components on a Vero board.

_____

_____

1 mark x 2 = 2 marks

d) **Figure C** shows an electronic circuit diagram. On the Vero board template given b
draw, the component layout of the circuit shown in **Figure C.**

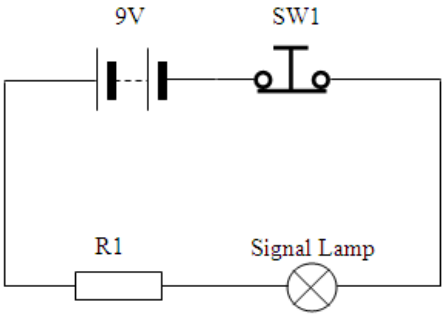
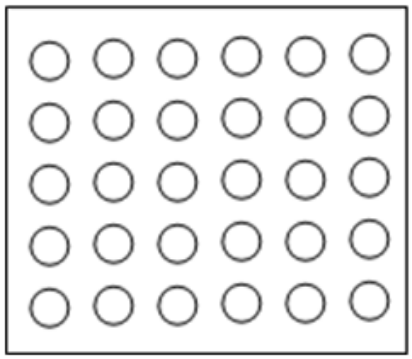


Figure C



4 marks

10. Paul designed an electronic circuit, so that, when the temperature rises above 28º C, a DC motor rotates. From his research Paul found that a Darlington pair is needed to amplify the input current, so that a 6V relay could be energized, hence the DC motor will rotate.
Figure D shows the electronic circuit diagram without the Darlington pair.

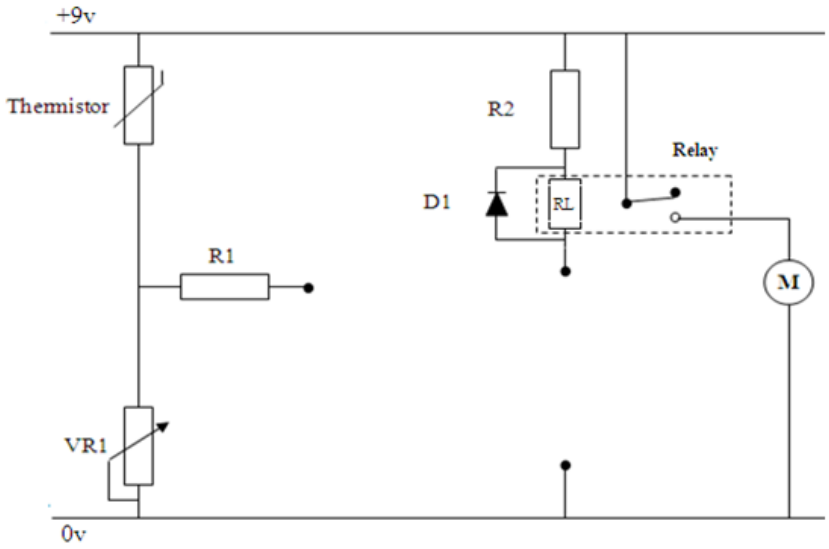


Figure D

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

2 marks

b) Give a reason why Paul used a diode in his circuit..

_____

1 mark

c) On the circuit shown in **Figure D** draw an SPST type switch, so that Paul can switch the circuit ON and OFF when necessary.

1 mark

d) State why Paul connected a resistor in series with the relay.

_____

2 mar

11. The circuit shown in **Figure E** was designed by a student for his project. He used two AA primary type batteries connected in series, an SPST latched type switch, a fixed resistor and a 2.3V; 25mA green LED.

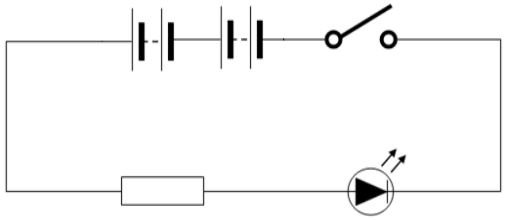


Figure E

a) Calculate the total voltage of the two AA primary type batteries connected in series. Show all working.

_____

1 mark

b) What can he use instead of the primary batteries to make the circuit more environmentally friendly?

_____

1 mark

c) What is meant by a latched ON/OFF type switch?

_____

2 marks

d) Calculate the value of the resistor so that when the switch is pressed, the LED will not burn out. Show all working.

_____

_____

2 marks

SECTION D: **FOOD**

12. Give TWO sensory features that you would include for a vegetable product which must appeal to children between four and ten years old.

_____

_____

2 marks

13. Give THREE factors that affect people when making food choices.

_____

_____

_____

3 marks

14. Which of the five nutrients do not give us energy?

i _____ ii _____

2 marks

15. Match the following statements with their appropriate endings.

1	Eat more pulses such as dry peas, beans and lentils…		…as fats of animal origin are saturate and raise the level of cholesterol in the blood.
2	Eat fruits whenever possible with the skin instead of pastries…		…as these are not stored in the body for long.
3	Eat foods that contain the water soluble vitamins B and C every day...		…as these are good sources of protein.
4	Eat less fats of animal origin…		…as these are good sources of fibre and vitamins.

4 marks

16. a) Give FOUR rules health and safety precautions that must be followed when preparing food.

_____

_____

_____

_____

2 marks

b) Give THREE reasons why health and safety precautions are taken to ensure that
safe.

_____

_____

_____

3 marks

17. Match the following working properties with the appropriate statements.

- fermentation
- aerating
- binding
- thickening

a) Dry ingredients are held together by water or milk. _____

b) Oats can be used in soups and sauces. _____

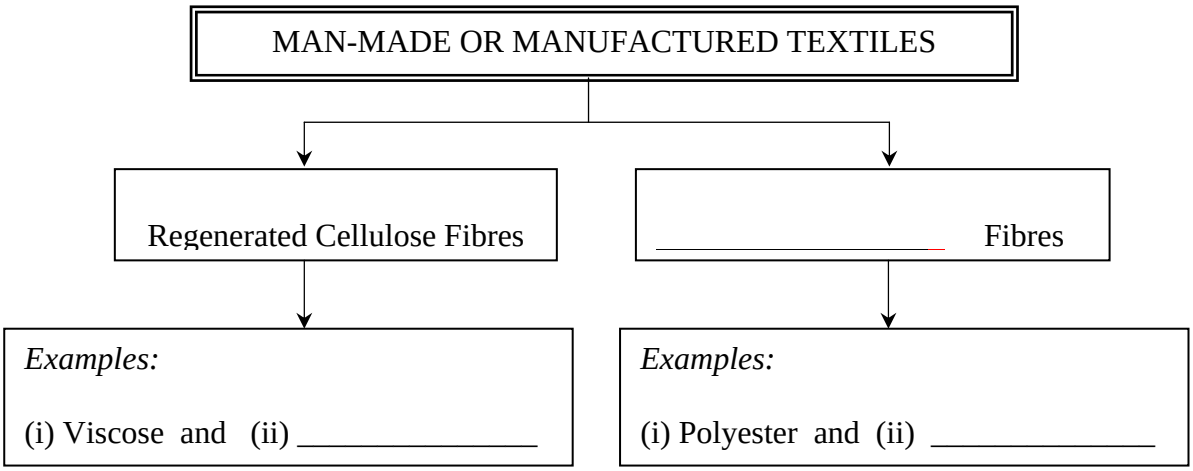
c) Yeast causes a foaming action, releasing gas bubbles into the dough to make it lighter. _____

d) Ingredients such as eggs are whisked to introduce air. _____

4 marks

SECTION E: **TEXTILES** 20 marks

18. **Figure F** shows the front and the back view of a cushion cover.



2 marks x 3 = 6 marks

19. A method of producing fabric is by "Weaving". State the TWO other methods by w
fabric can also be constructed.

i _____ ii _____

1 mark x 2 = 2 mark

20. List THREE methods of neatening an edge on a textiles product.

i _____ ii _____ iii _____

1 mark x 3 = 3 marks

21. **Figure F** shows the front and the back view of a cushion cover.

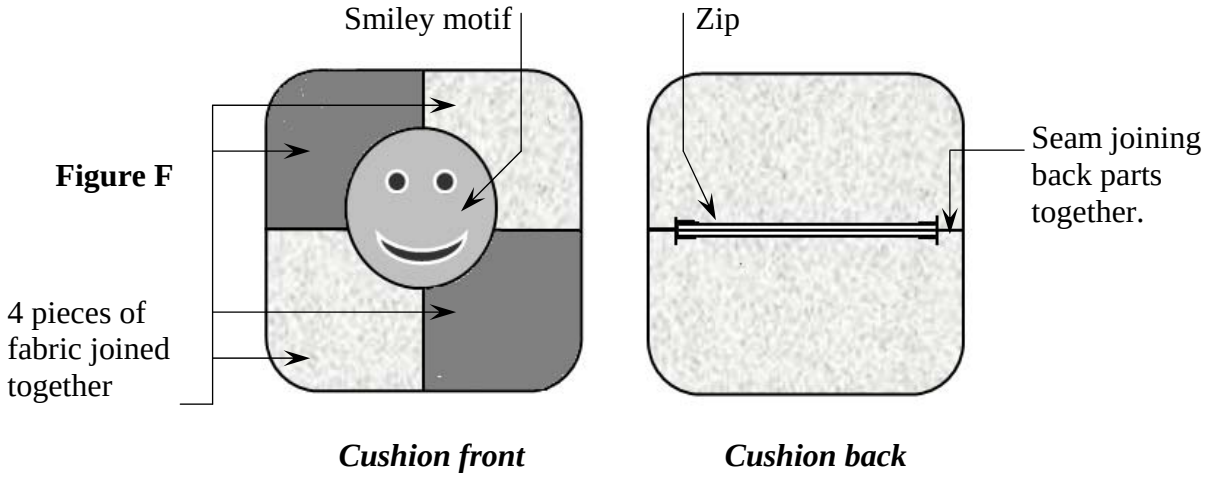


Figure F

a) The following are stages involved in making the cushion shown in **Figure F**, but these are not in the correct order. Re-write the steps in a correct logical sequence. The first stage has been done for you.

- **Sew in zip**
- **Attach smiley motif**
- **Join front and back together**
- **Sew the front fabric pieces together**
- **Sew seam at back of cushion**
- **Cut out fabric pieces**

Step 1: Cut out fabric pieces

Step 2: _____

Step 3: _____

Step 4: _____

Step 5: _____

Step 6: _____

5 marks

b) Refer to **Figure F**. The cushion front is decorated by the 'Smiley' motif. Mentio
methods by which that motif could be produced.

i _____ ii _____

1 mark x 2 = 2 marks

c) Refer again to **Figure F.** A zip is used to close the back side of the cushion. State TWO other methods that can be used instead of the zip.

i _____ ii _____

1 mark x 2 = 2 marks