JUNIOR LYCEUM AND SECONDARY SCHOOL
ANNUAL EXAMINATIONS 2009

Directorate for Quality and Standards in Education
Educational Assessment Unit

FORM 4 **DESIGN AND TECHNOLOGY** **TIME: 2 hours**

Name: _____ Class: _____ Set: _____

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

FOR TEACHERS' USE ONLY DISTRIBUTION OF MARKS

	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									

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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Questions 1 - 4 relate to the Situation given below.

SITUATION

(Refer to Figure 1a and Figure 1b)

A restaurant owner needs to fix a wooden menu board to the lamp post outside the entrance of his restaurant.

He has asked you to give him an idea of how the menu board can be fixed to the lamp post.

He <u>does not wish</u> that screws or bolts to be visible from the front.

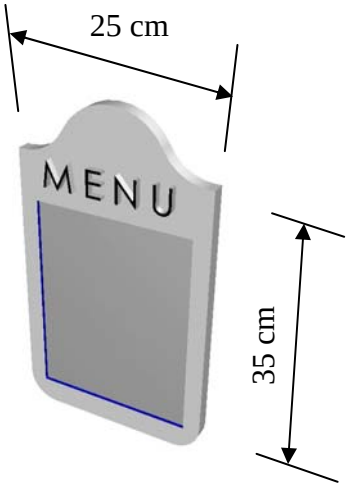


Figure 1a: <u>MENU BOARD</u>
Material:
Red Deal Wood 2.5 cm thick

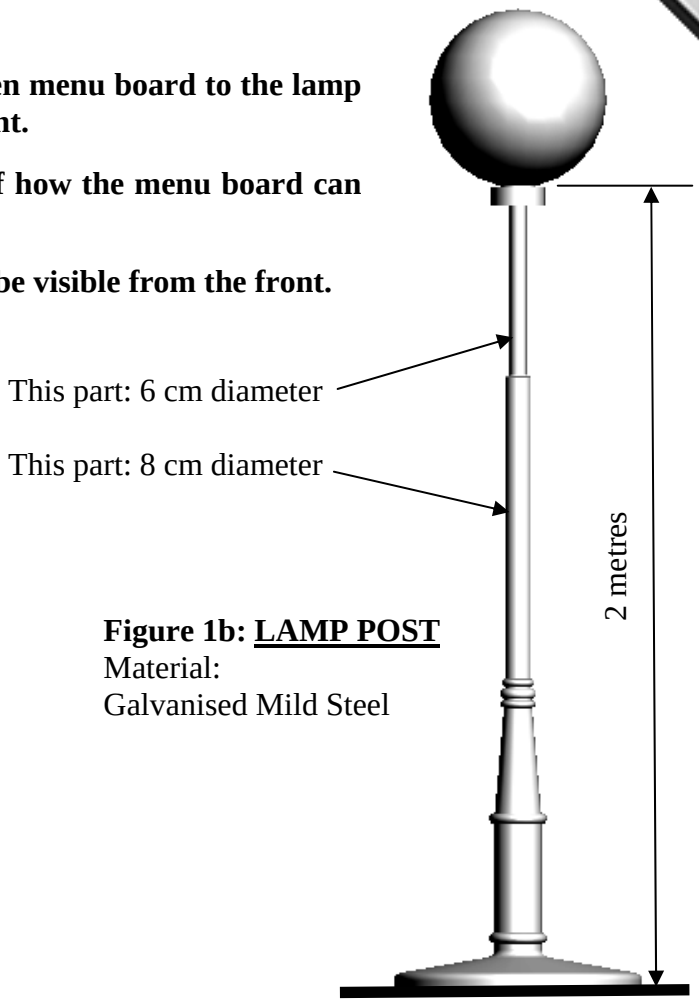


Figure 1b: <u>LAMP POST</u>
Material:
Galvanised Mild Steel

1. Since the menu board is going to be be fixed outside the restaurant, what type of finish would you suggest to make it more weather resistant? (Refer to figure 1a)

_____ **2 marks**

2. The material of the lamp post shown in figure 1b is galvanised mild steel. Why is it galvanised?

_____ **2 marks**

3. State **TWO** methods how you will research about the ideal height at which the menu board would be fixed.

_____

_____ **2 marks**

4. By means of sketches show an initial idea for a bracket suitable for fixing the me
to the lamp post. Any type or combination of materials can be used for making the b

Remember that the restaurant owner <u>does not wish</u> any screws or bolts to be visible on th
front face of the menu board.

Label your sketches giving an indication of sizes, material/s, finish and any other important information for clarifying your idea.

14 marks

5. Sketch and name two types of joints used in wood work.

Name of joint:	Name of joint:

4 marks

6. Give one use for each of the following machines found in a Resistant Materials laboratory.

Machine	**Used for:**
Band saw	----------
Belt sanding machine	----------
Bench Drill	----------

3 marks

7. Name two types of thermoplastics and give one application of each.

Type of plastic	**Application**

	----------

4 marks

8. List two processes by which plastics can be formed.

_____ and _____

2 marks

9. State one safety precaution that should be observed for each hand tool mentioned below.

i Flat file _____

ii Bradawl _____

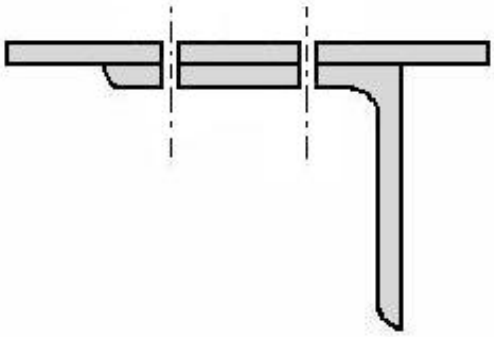
iii Flat screw driver _____

3 marks

10. A development sketch which Karl did for his design folio shows that he forgot to show two pop rivets joining a small piece of flat bar to an angle iron. (Figure 2)

Finish off figure 2 by drawing the pop rivets which Karl had to show.

Figure 2



2 marks

11. Underline which of the following make **permanent** joints?

- Pop-rivet
- Bolt and nut
- Self tapping screw
- Welding

2 marks

12. Figure 3 shows the colour bands of a fixed resistor.
What is its resistance value and tolerance?

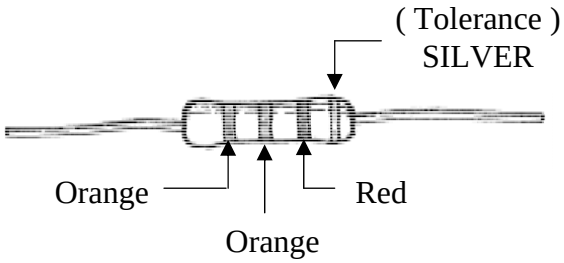


Table for calculating resistance			
Colour	**First band**	**Second band**	**Third band**
Black	0	0	
Brown	1	1	0
Red	2	2	00
Orange	3	3	000
Yellow	4	4	0000
Green	5	5	00000
Blue	6	6	000000
Violet	7	7	0000000
Grey	8	8	00000000
White	9	9	000000000

Answer: _____ ohms (Tolerance: _____ %)

4 marks

13. Michael intends to install indicator lamps on his scooter. He has two 6V bulbs and one 6V battery. Draw a circuit diagram which he can use and state what type of switch Michael must use for his project.

4 marks

14. By means of a circuit diagram show how a Darlington pair is used to switch on an Led. Label all components and connections of your diagram.

6 marks

15. Figure 4 shows a 555 IC. Fill in each box by using the following inputs and ou
indicate the function of every pin.

- Output voltage
- Threshold
- Input voltage
- Control voltage
- Discharge
- Trigger
- Reset
- Ground (0 volts)

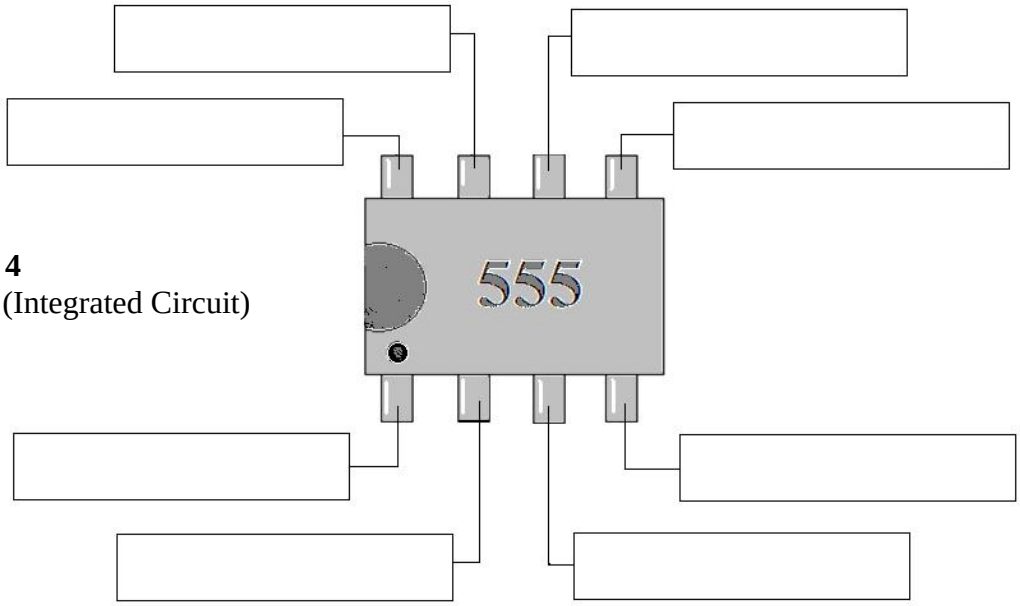


Figure 4
555 IC (Integrated Circuit)

4 marks

16. Give two precautions that should be taken whilst soldering a MOSFET transistor onto a strip-board.

_____

_____

2 marks

TEXTILES TECHNOLOGY

17. Name two seams that can be used when manufacturing a garment.

_____ and _____

2 marks

18. List two methods of neatening an edge (edge finish) on a textile product.

_____ and _____

2 marks

19. Figure 5 shows a typical label for a garment. What do the care symbols on this label represent?

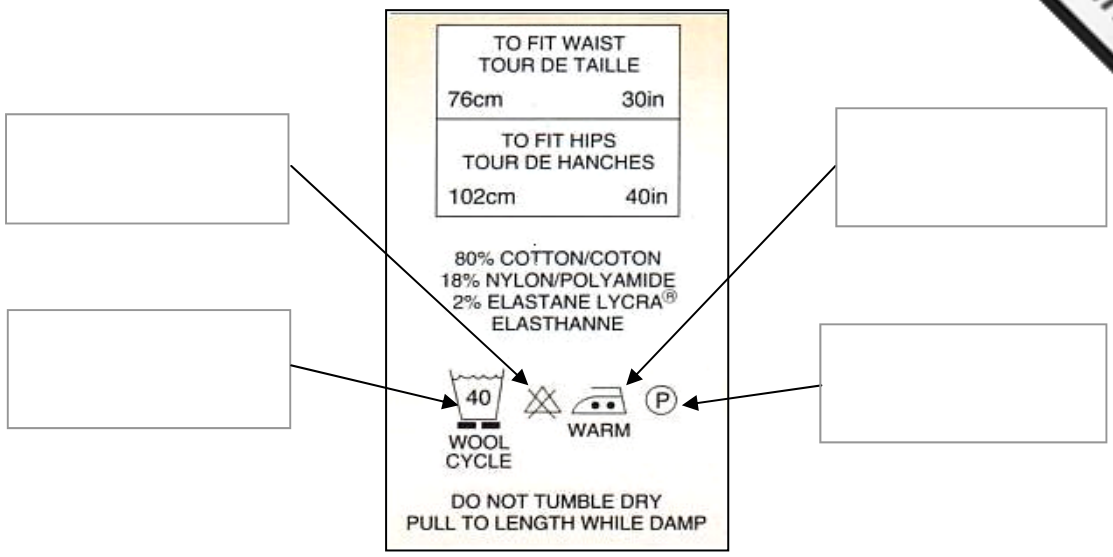


Figure 5
TYPICAL LABEL FOR A GARMENT

8 marks

20. Draw arrows to match each textile product to the most suitable characteristic for it. The first one has been done for you.

TEXTILE PRODUCT	CHARACTERISTIC
HOTEL CURTAIN	Antistatic
CARPET	Stain (soil) resistance
RAIN COAT	Flame (fire) retardant
SCHOOL SHIRT	Crease resistance
CHAIR COVER	Water proof

4 marks

21. Give one precaution that you must take in a Design and Technology textiles laboratory when using:

i. an electric sewing machine _____

ii. a steam iron _____

4 marks

22. Why is food preserved?

_____

1 mark

23. Name one important method of preservation by heat.

_____

1 mark

24. What is the difference between 'Use By' and 'Best Before' dates?

'Use by' *is the date* _____

'Best before' *is the date* _____

2 marks

25. Explain the function of these ingredients in a whisked sponge cake.

Ingredient	**Function**
EGGS	
SUGAR	
FLOUR	
JAM	

4 marks

26. By law, when should the details of **NUTRITIONAL INFORMATION** be displayed on food labels?

_____

2 marks

27. State one method used for commercial freezing and give a short description of

Method: _____

Description: _____

_____

4 marks

28. Which method of cooking does each group of statements refer to?

Statements	Method of Cooking
▪ The water temperature range is from 100-120°C ▪ The amount of water used is half that used in boiling ▪ The cooking time is reduced	**1.** ----------
▪ The food is cooked in a hot oven ▪ Small amounts of fat are used to prevent the food from drying out	**2.** ----------
▪ The food is cooked directly in water ▪ Heat is applied slowly until the right temperature is reached	**3.** ----------

3 marks

29. The food we eat provides us with energy and is measured in kilocalories (kcal)

How many kilocalories are there in:

1 gram of protein? _____ *kcal*

1 gram of carbohydrate? _____ *kcal*

1 gram of fat? _____ *kcal*

3 marks