An Roinn Oideachais agus Eolaíochta
Junior Certificate Examination, 2001

S69a

3313

TECHNOLOGY

HIGHER LEVEL
200 Marks

Wednesday, 20th June, Morning, 9:30 to 11:30

SECTION A

INSTRUCTIONS

1. Answer Section A (short answer questions). — 100 marks
2. Answer either (a) or (b) from each question in Section B. — 50 marks
3. Answer one question from Section C. — 50 marks
4. Hand up this paper at the end of the examination along with answer sheets for Section B and C.

Centre Number

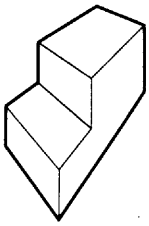
Examination Number

For Examiner	
Total Mark	
Question	Mark
Section A	
Section B Q1 (a)	
(b)	
Q2 (a)	
(b)	
Section C 3	
4	
5	
6	
Total	
Grade	

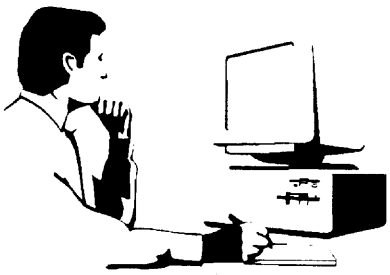
MAKE SURE TO WRITE YOUR EXAMINATION NUMBER IN THE BOX PROVIDED ON THIS PAGE

Section A Answer 25 questions from this section - all questions carry equal marks. 100 Marks

1. Locate the **two** vanishing points on this sketch.



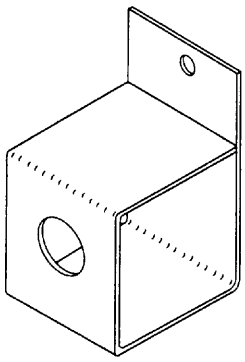
2. State **two** advantages of using CAD to produce drawings.



(i) : _____

(ii) : _____

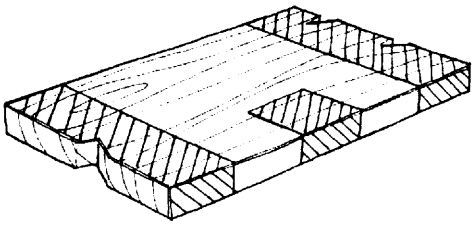
3. State **two** types of rendering that might be used to enhance this sketch.



(i) : _____

(ii) : _____

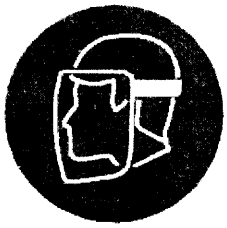
4. Explain the meaning of the **hatched lines** on the sketch.



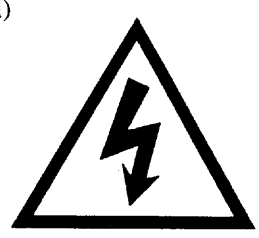
Answer : _____

5. What does **each** symbol indicate?

(i)



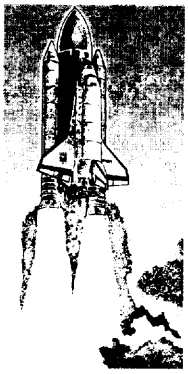
(ii)



(i) : _____

(ii) : _____

6. State **one** reason why new materials are required for space exploration.



Reason : _____

_____

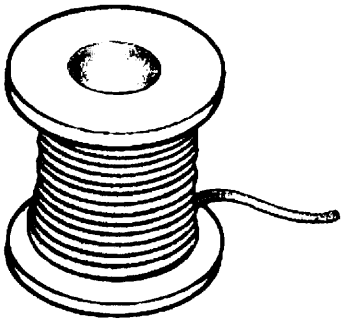
_____

_____

_____

_____

7. Solder is an alloy of **two** metals. Name these metals.



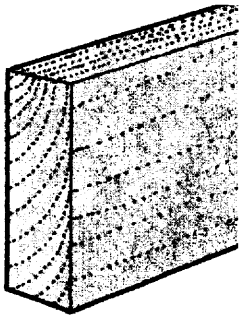
Metal 1 : _____

_____

Metal 2 : _____

_____

8. In relation to wood, what is a **Veneer**.



Veneer : _____

_____

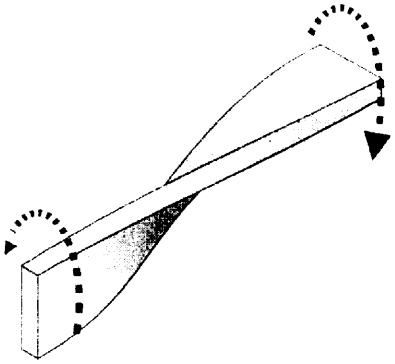
_____

_____

_____

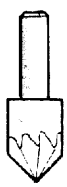
_____

9. Name the **force** acting on the material shown.



Force : _____

10. Name and state **one** use of this tool.



Name : _____

_____

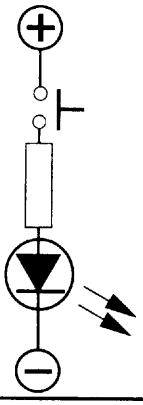
Use : _____

_____

_____

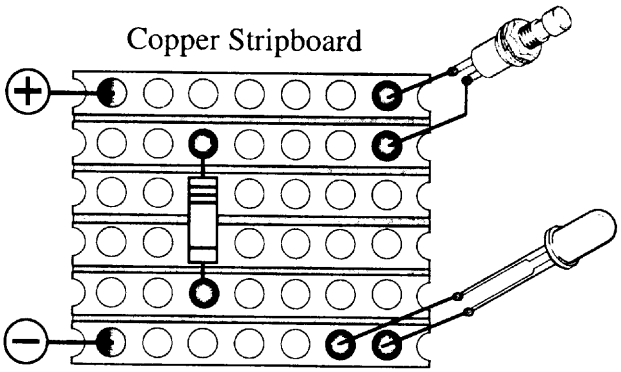
_____

11. One of the components shown has been incorrectly wired on the copper stripboard. Indicate this component with an '**X**'.

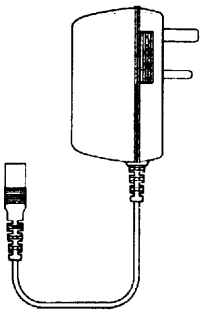


Circuit

Copper Stripboard



12. State the **function** of a transformer in an electric circuit.



Answer : _____

_____

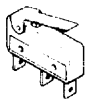
_____

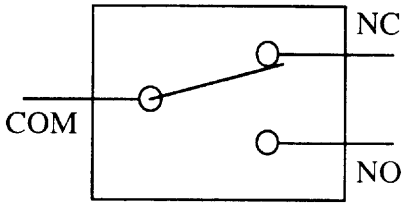
_____

_____

_____

13. State the meaning of any **two** of the abbreviations : COM, NC or NO.





COM : _____

_____

NC : _____

_____

NO : _____

_____

14. **Name** and sketch the **symbol** for the Logic Gate that will produce this truth table.

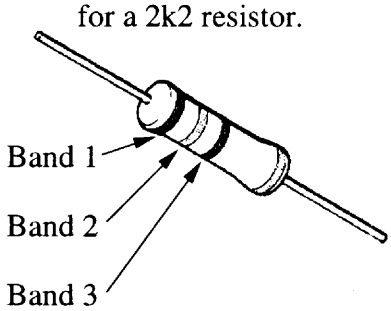
Truth Table

Input	Output
A	B
0	1
1	0

Name : _____

Symbol :

15. State the colour codes for a 2k2 resistor.



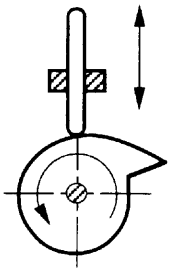
Colour	Value
Black	*0*
Brown	*1*
Red	*2*
Orange	*3*
Yellow	*4*
Green	*5*
Blue	*6*
Violet	*7*
Grey	*8*
White	*9*

Band 1 : _____

Band 2 : _____

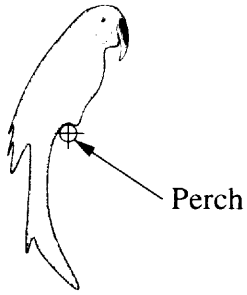
Band 3 : _____

16. Name this mechanism.



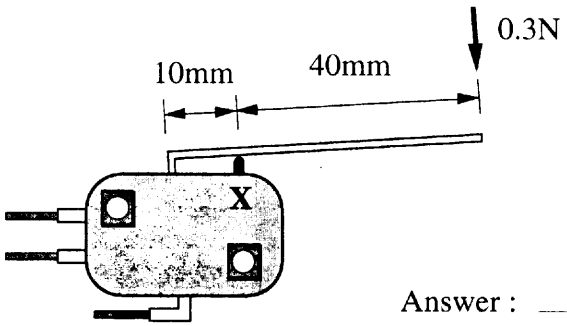
Answer : _____

17. Why will the toy balance on the perch as shown.



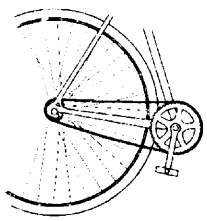
Answer : _____

18. Calculate the force applied to the lever microswitch at 'X', in the sketch.



Answer : _____

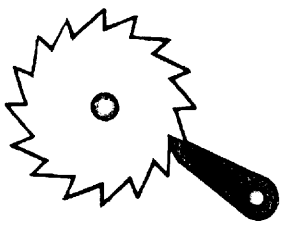
19. State **two** reasons why oil is used on the chain of a bicycle.



(i) : _____

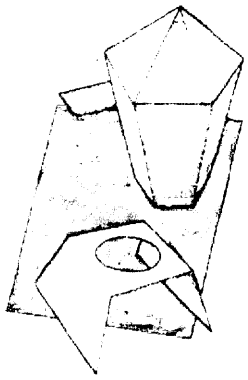
(ii) : _____

20. Name the mechanism shown.



Answer : _____

21. State **two** reasons for making a model as part of the design process.



(i) : _____

(ii) : _____

22. State **two** ways in which technology has helped prolong the shelf live of foodstuff.

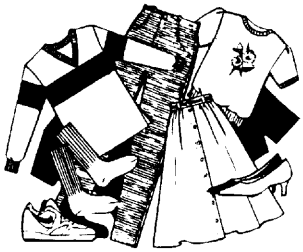
(i) : _____

(ii) : _____

23. State **one** way in which technology might be used to assist elderly people in their homes.

Answer : _____

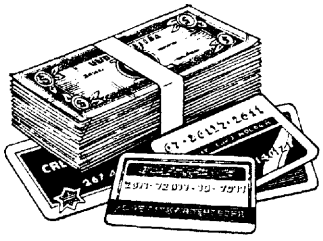
24. Name **one** fabric derived from animal fibres and **one** fabric derived from plant fibres.



Animal : _____

Plant : _____

25. State **two** advantages of using 'plastic cards' in place of cash.

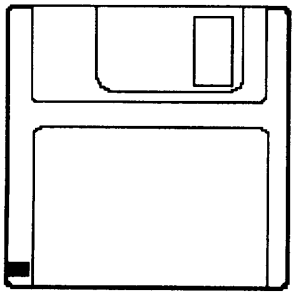


Advantage 1 : _____

Advantage 2 : _____

26. Floppy disks are used to store electronic data.

Name **two** other methods of storing electronic data.



(i) : _____

_____

_____

(ii) : _____

_____

_____

27. In the case of any **two** of the people named below state the technological contribution they made to society.

J.L. Baird,
H. Ford,
G. Eastman,
G. Bell.

Name : _____

Contribution : _____

_____

_____

Name : _____

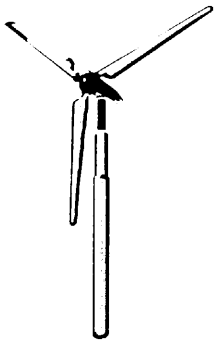
Contribution : _____

_____

_____

28. Wind energy is a renewable energy source.

Name **two** other renewable energy sources.



(i) : _____

_____

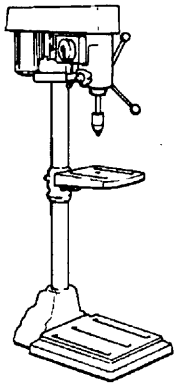
_____

(ii) : _____

_____

_____

29. State **two** safety precautions that should be taken when working with power tools.



(i) : _____

_____

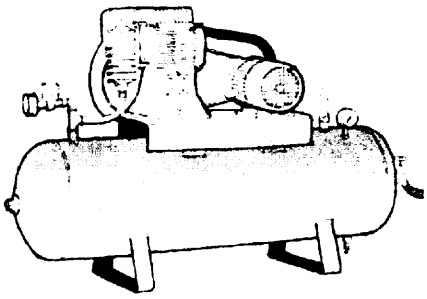
_____

(ii) : _____

_____

_____

30. Name **two** everyday applications of pneumatics.



(i) : _____

_____

_____

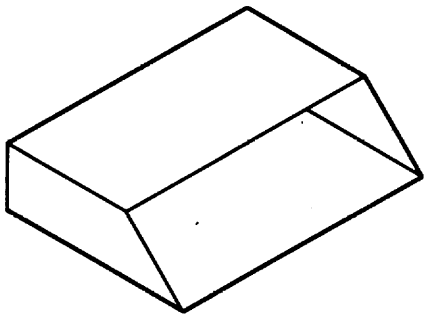
(ii) : _____

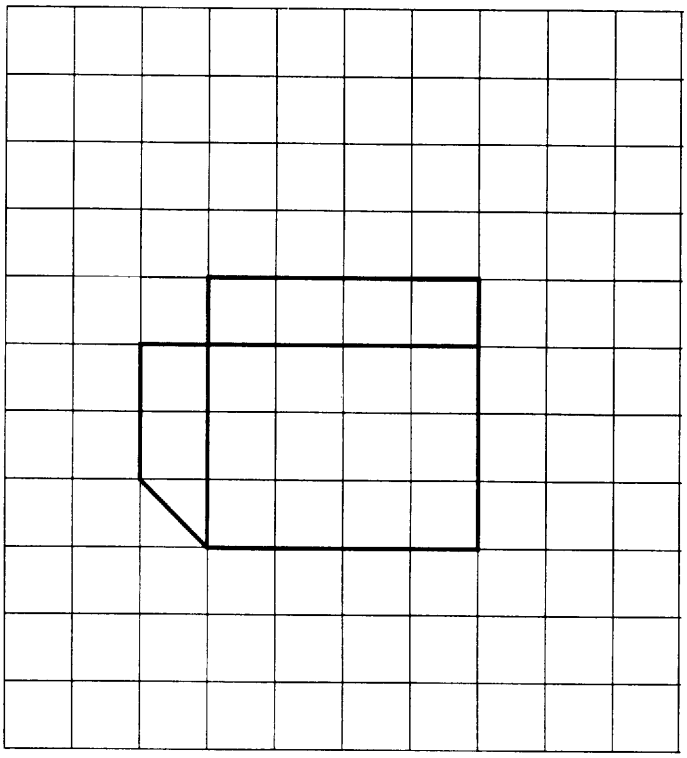
_____

_____

continued ☛

31. Complete the development of the dustpan shown.

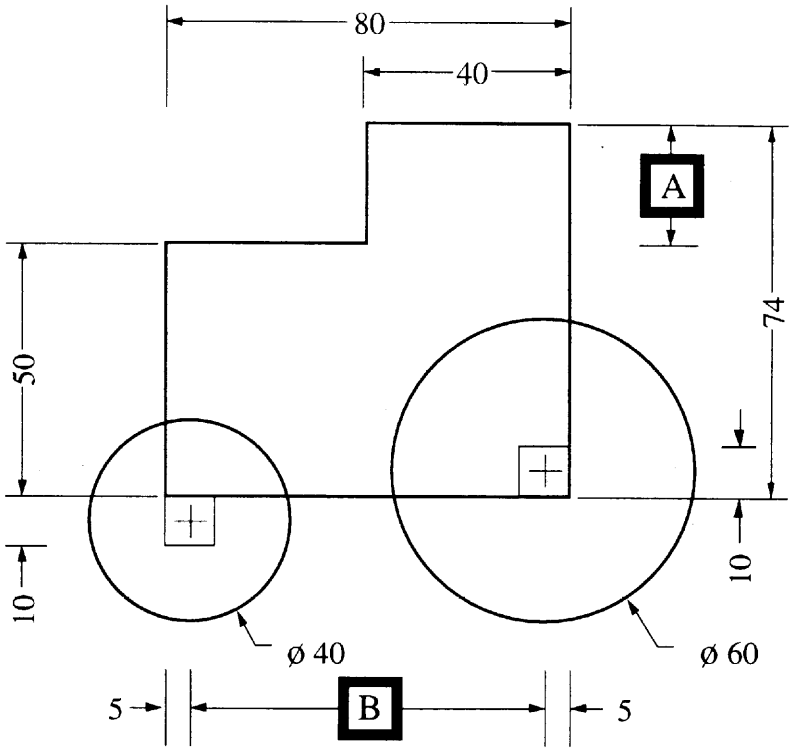




32. Calculate the missing dimensions 'A' and 'B' in the drawing shown.

A = _____

B = _____



An Roinn Oideachais agus Eolaíochta
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S69

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TECHNOLOGY

HIGHER LEVEL
200 Marks

Wednesday, 20th June, Morning, 9:30 to 11:30

SECTION B and SECTION C

SECTION B - 50 marks

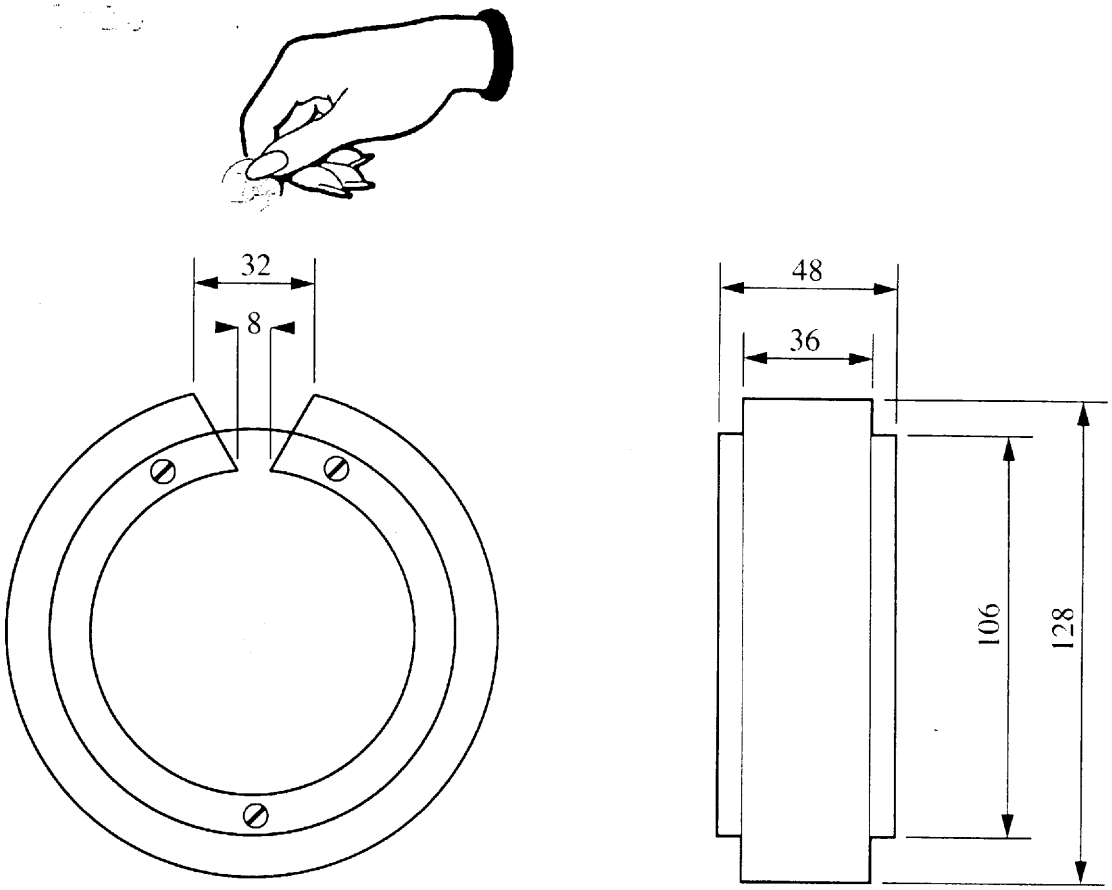
SECTION C - 50 marks

INSTRUCTIONS

1. Answer <u>either (a) or (b)</u> from <u>each</u> question in Section B.
2. Answer <u>one</u> question from Section C.
3. Make sure to <u>hand up Section A</u> with your answer sheets to this paper.

SECTION B - 50 Marks **Question 1, answer either (a) or (b) from this question**

1 (a) The sketch shows a front elevation and end view of a design for a money box.
The box is to be manufactured from native hardwood with two acrylic panels.



Elevation End View

All dimensions are in millimetres

(i) 1. Draw the plan view of the money box.

2. The acrylic panels are screwed to the wooden body.
Outline the steps necessary to prevent the acrylic panels cracking when drilling the screw holes.

10 marks

(ii) 1. Design a suitable base to prevent the money box from rolling.

2. Sketch a suitable addition to the money box to prevent the easy removal of coins.

10 marks

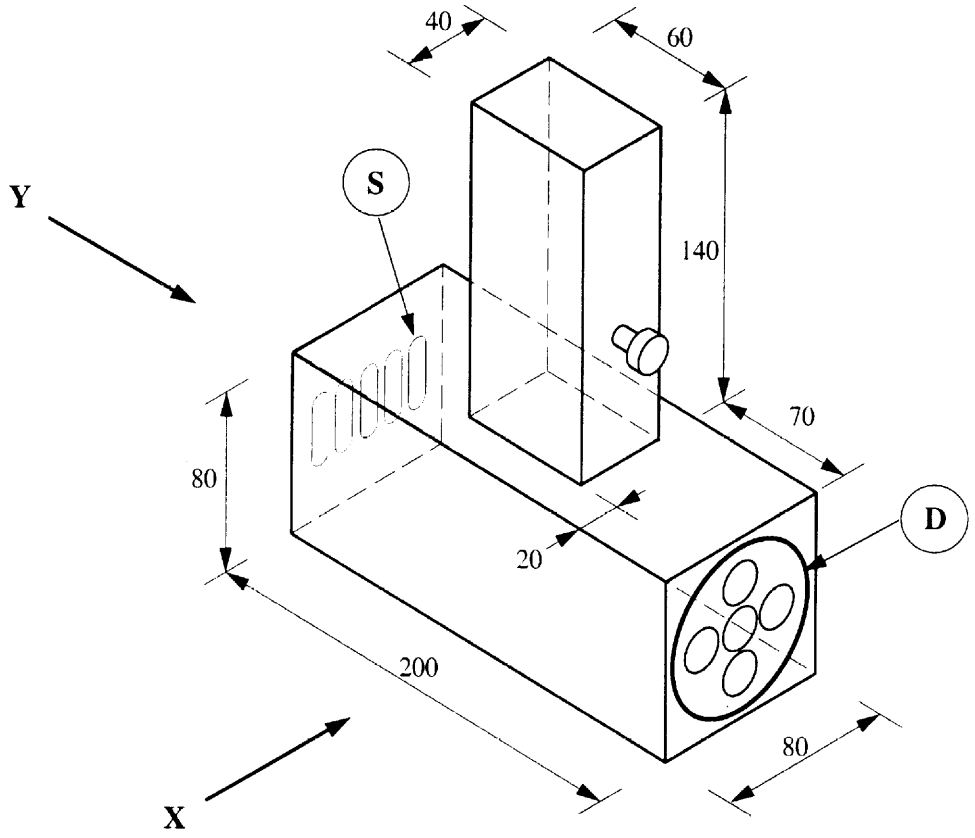
(iii) 1. Name **one** native hardwood.

2. Describe how to finish the hardwood to enhance the money box.

5 marks

- *OR* -

1 (b) The sketch shows a design for a hand held light projector to be manufactured from acrylic. Different light patterns can be produced by changing the disk 'D'.
The switch and battery are housed in the handle. The bulb and reflector are housed in the body.



All dimensions are in millimetres

(i) 1. Draw an elevation in the direction of arrow X.

2. Draw an end view in the direction of arrow Y. (the ventilation slots 'S' need not be included)

10 marks

(ii) 1. Sketch a suitable design to allow the disk 'D' be easily removed and replaced.

2. Outline the steps required to cut out the ventilation slots 'S'.

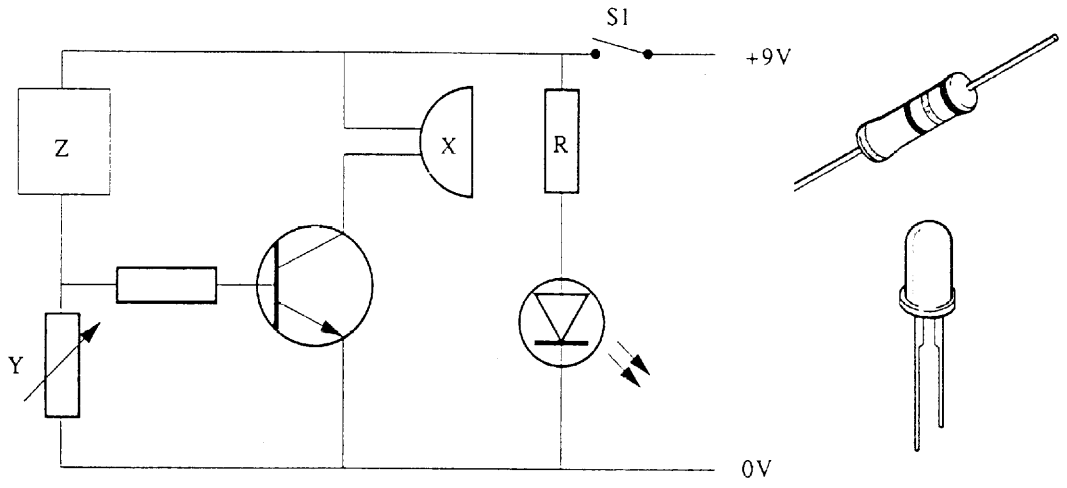
10 marks

(iii) Outline the steps required to produce a smooth edge on acrylic.

5 marks

SECTION B - 50 Marks **Question 2, answer either (a) or (b) from this question**

2 (a) The sketch shows a circuit for a high temperature alarm.



(i) 1. Identify the components 'X' and 'Y'.

2. State the purpose of component 'Y' in the circuit.

3. Why is a transistor used in this circuit ?

4. How can the cathode of the LED be correctly identified?

10 marks

(ii) 1. If the maximum permitted current for the LED is 0.02A, show how to calculate the value of the resistor 'R', required for the circuit.

2. Which one of the following values should be used for resistor 'R'?

270 Ω, 330Ω, 390Ω, 470Ω, 560Ω.

3. The fourth band on a resistor is either silver or gold.
What does the colour of this band on a resistor indicate?

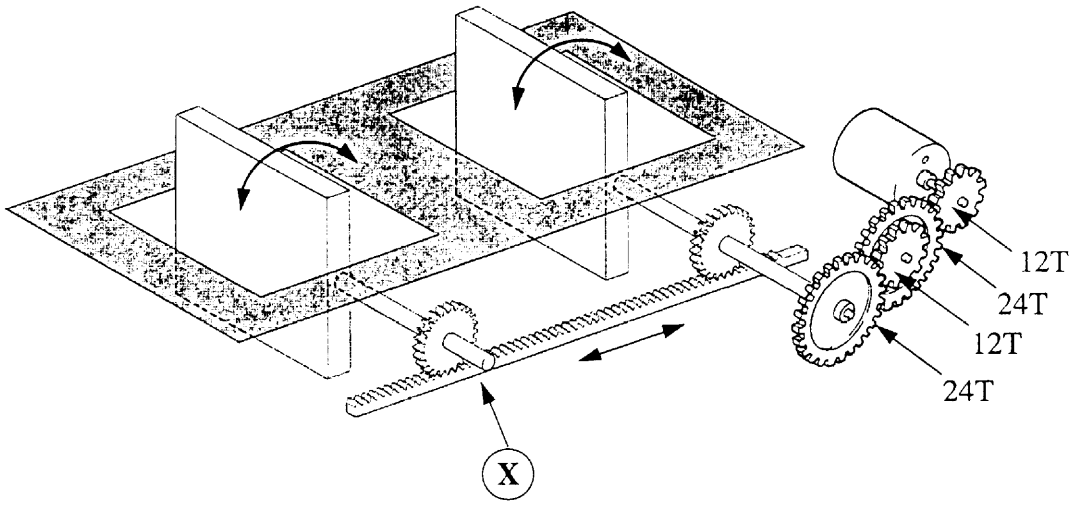
10 marks

(iii) Name and sketch the symbol for the component which should be located at 'Z'.

5 marks

- *OR* -

2 (b) A motor driven mechanism is required to simultaneously open and close two air vents in a greehouse.



(i) 1. Name the gear arrangement at 'X'.

2. Sketch and name **two** other mechanisms that could be used in place of 'X'.

10 marks

(ii) 1. If the motor turns at 60 RPM, calculate the time taken for the vents to rotate through 90°.

2. State **two** changes which could be made to double the time taken for the vents to open.

10 marks

(iii) Explain briefly why limit switches are recommended in the operation of this air vent system.

5 marks

Section C - 50 Marks

Answer **one** question from this section - all questions carry equal marks.

This section relates to **Technology & Society, Design & Manufacture and Control Systems.**

3 Technology and Society

Modern societies are dependant on advanced technologies for everyday operations.

(a) (i) Explain, using **two** examples, how technology is used by security companies in a modern city.

(ii) Explain, using **two** examples, how electronic communications in a modern society have changed over the last 20 years.

(iii) Explain, using **two** examples, how the retail industry has been changed by technology.

30 marks

(b) (i) Name and identify the sources of **two** forms of pollution in a modern society.

(ii) Outline how technology can provide solutions to this pollution.

10 marks

(c) Outline **two** ways in which transportation has been improved by new technologies.

10 marks

4 Control Systems & Technology and Society

(a) (i) Using **two** examples, outline the advantages of using computer controlled machines in modern industry.

(ii) Explain, why a computer programme is required to control these machines.

(iii) In relation to a computer, explain the meaning of the terms:

1. CAM,
2. RAM.

30 marks

(b) Computers are used to access the internet. Explain, using **two** examples, how this technology has affected our daily lives.

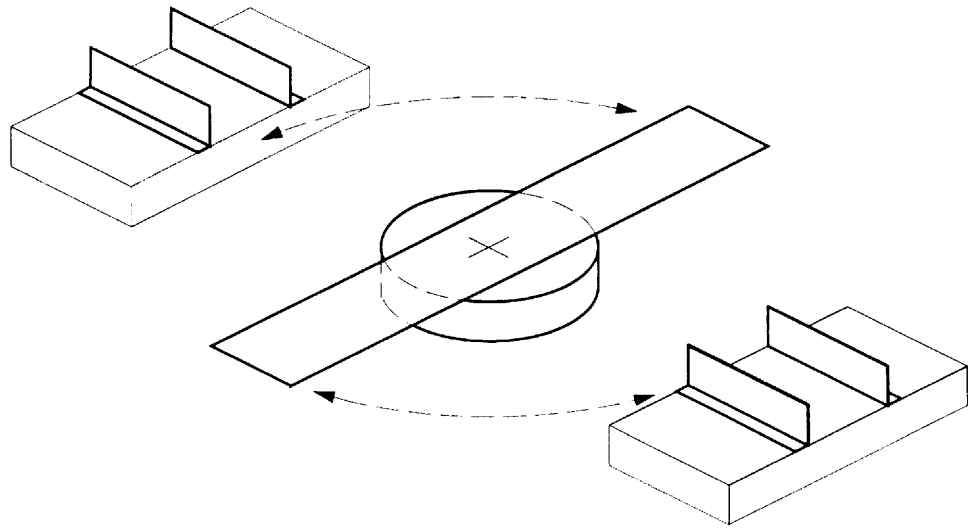
10 marks

(c) Explain why First World computer controlled manufacturing methods are not necessarily appropriate for Third World countries.

10 marks

5 **Design and Manufacture.**

A working model of a swing bridge, as shown, is required to turn slowly using a suitable mechanism.



(a) (i) Modify the design of the bridge to include structural features that will prevent the bridge from sagging.

(ii) Indicate clearly the materials you would use and outline the processes required to make the model. The mechanism need not be included.

20 marks

(b) (i) Sketch a design for a suitable mechanism to rotate the bridge slowly. Explain how the mechanism works.

(ii) Indicate how you would ensure that the mechanism stopped the bridge at the correct location every time.

20 marks

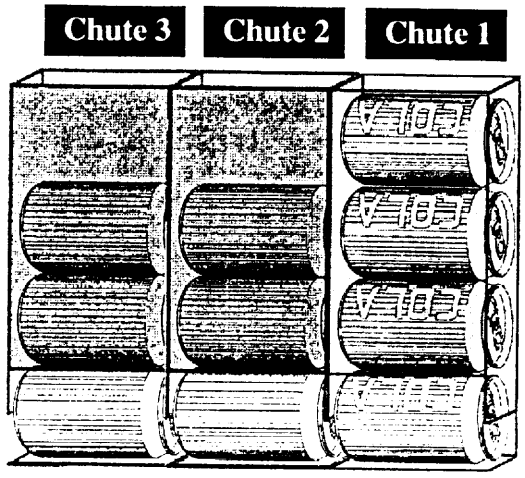
(c) Sketch **two** safety features that might be included in the design.

10 marks

6 **Control Systems**

A control system, using logic gates, is required to dispense soft drink cans from a coin operated machine.

Three chutes with different soft drinks are present in the machine.



(a) Design a system, which will release a can if:

1. the correct coin has been inserted in the coin slot,
2. the product selection button has been pressed and
3. the chute contains a can.

Explain, using a truth table, how your system operates.

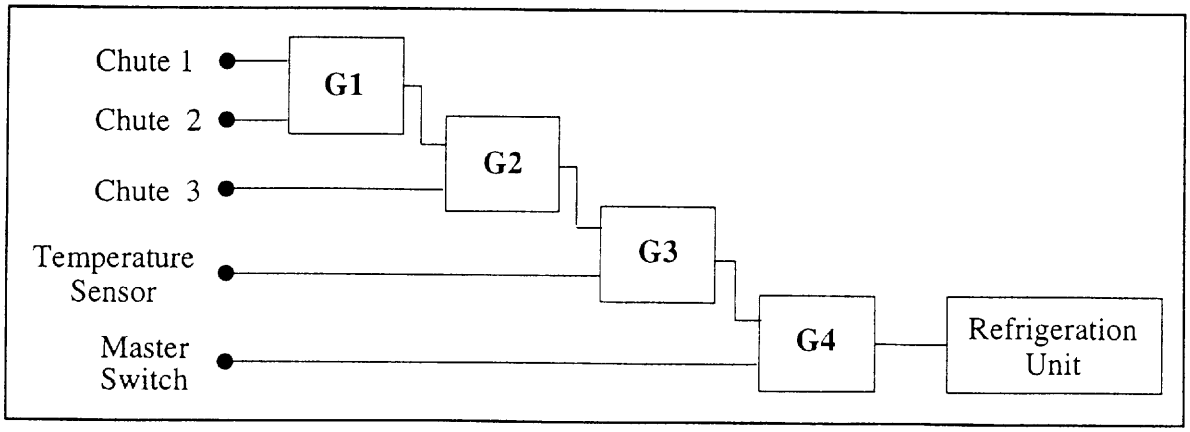
20 marks

(b) Include a modification to your system which will automatically display an 'Out of Stock' sign if a chute is empty.

10 marks

(c) The system as shown below is designed to activate the refrigeration unit in the soft drinks machine if :

1. any one of the chutes contains a can,
2. a high temperature is detected and
3. the master switch is on.



(i) Name the gates required at G1, G2, G3 and G4.

(ii) Explain using a truth table how gate G1 operates.

20 marks