Coimisiún na Scrúduithe Stáit
State Examinations Commission

TECHNOLOGY

Junior Certificate Examination, 2008
HIGHER LEVEL
200 Marks
Wednesday, 18th June, Afternoon, 2:00 to 4:00

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

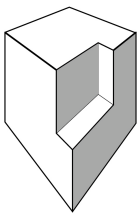
Examination Number

For Examiner	
Total Mark	
Question	**Mark**
Section A	
Section B Q1 (a)	
(b)	
Q2 (a)	
(b)	
Section C Q3	
Q4	
Q5	
Q6	
Total	
Grade	

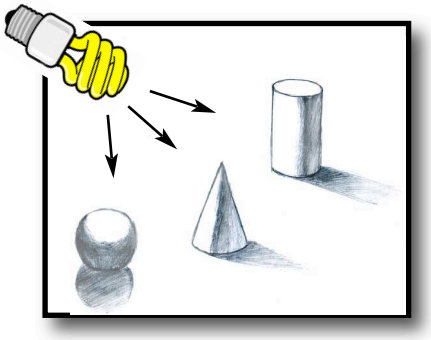
MAKE SURE TO WRITE YOUR EXAMINATION NUMBER IN THE BOX PROVIDED ON THIS PAGE

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

1. Indicate clearly how to locate the vanishing points in the sketch shown.



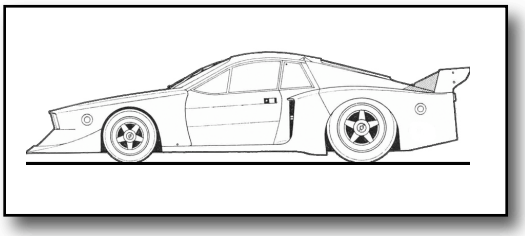
2. Identify **two** types of rendering used in the sketch shown.



(i): _____

(ii): _____

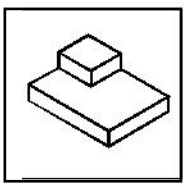
3. State **two** advantages of CAD for the production of a drawing.



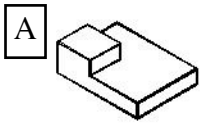
(i): _____

(ii): _____

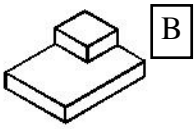
4. Which one of the views A, B or C is a rotated view of image X?



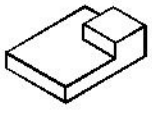
X



A



B



C

Answer: _____

5. State the meaning of each of the symbols shown.

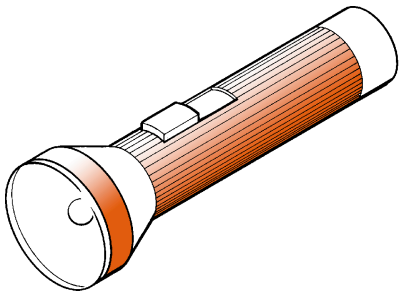
X

Y

X: _____

Y: _____

6. Name **two** energy conversions which take place when the battery operated torch shown is switched on.



From: _____

To: _____

From: _____

To: _____

7. State **two** precautions which should be taken to prevent acrylic sheet shattering when drilling a hole in the sheet.

(i): _____

_____

_____

_____

(ii): _____

_____

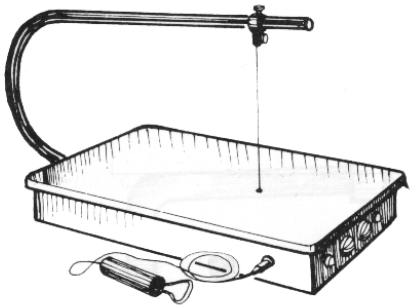
_____

_____

8. Identify the equipment shown

and

identify the material shaped by this equipment.



Equipment: _____

_____

Material: _____

_____

_____

9. State one advantage

and

one disadvantage of using the type of drill shown.

Advantage: _____

_____

_____

_____

Disadvantage: _____

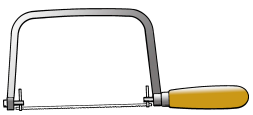
_____

_____

_____

10. Identify the two types of saw shown at 'X' and at 'Y'.

X



X: _____

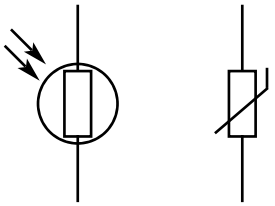
_____

Y

Y: _____

_____

11. Name the electronic components which are represented by the symbols shown.



X

Y

X: _____

_____

Y: _____

_____

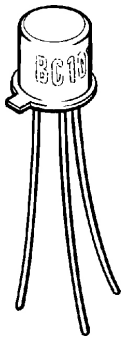
12. Identify the logic gate which will produce the truth table shown.

Truth Table

Input1	Input 2	Output
1	1	***0***
1	0	***1***
0	1	***1***
0	0	***1***

Logic Gate: _____

13. State the **two** functions which a transistor can have in a circuit.



(i): _____

_____

_____

_____

(ii): _____

_____

_____

_____

14. State **two** functions of a multimeter, similar to that shown.

(i): _____

_____

_____

_____

(ii): _____

_____

_____

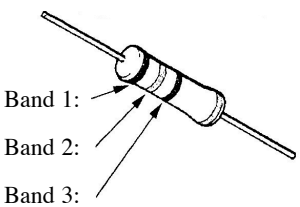
_____

15. Using the table shown, state the colour of the third band in each of the following resistors:

(a) 10k,

(b) 300Ω.

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



Answer:

(a) : _____

(b) : _____

16. The sketch shows a land yacht. Name the main force acting on the non-rigid stay 'X'

and

name a suitable lightweight material for the body of the yacht.

Force: _____

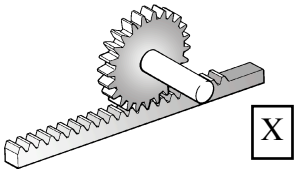
_____

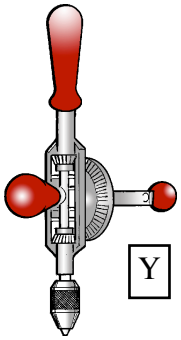
Material: _____

_____

_____

17. Identify the mechanisms shown at 'X' and at 'Y'.





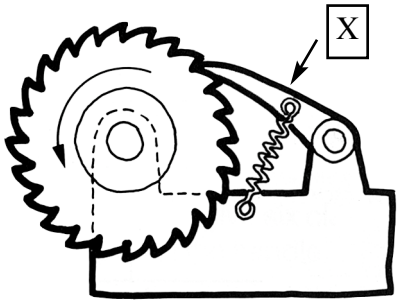
X: _____

_____

Y: _____

_____

18. Name the part marked 'X' and state its function.



Name: _____

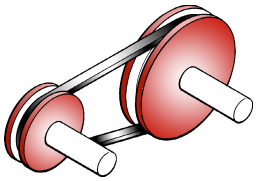
_____

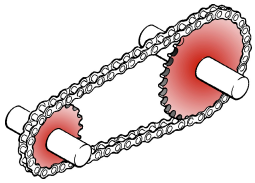
Function: _____

_____

_____

19. State **two** reasons why a belt system might be used in a mechanism in place of a chain system.





(i): _____

_____

_____

_____

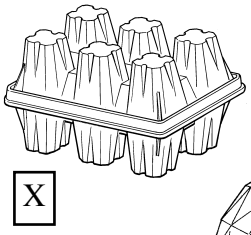
(ii): _____

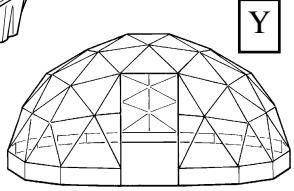
_____

_____

_____

20. Identify the two types of structure used in the eggbox at 'X' and in the dome at 'Y'.





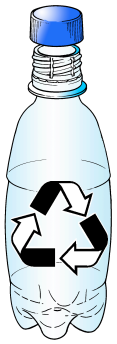
X: _____

_____

Y: _____

_____

21. State **two** reasons why plastic bottles should be recycled.



(i): _____

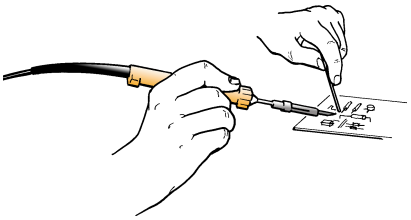
(ii): _____

22. Identify **two** data storage devices which can be used with a computer.

(i): _____

(ii): _____

23. State **two** safety precautions which must be observed when using a soldering iron.



(i): _____

(ii): _____

24. Name the modern **inventor** responsible for the invention of the bagless vacuum cleaner,

and

name an **invention** credited to Alexander Graham Bell.

Inventor: _____

Invention: _____

25. State **one** safety feature that should be incorporated into the toy Ferris wheel design shown.

(i): _____

(ii): _____

26. List **two** properties found in man-made fabrics not found in natural fabrics.

(i): _____

_____

_____

_____

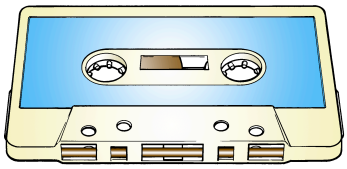
(ii): _____

_____

_____

_____

27. State **two** reasons why audio cassettes are no longer widely used for music recordings.



(i): _____

_____

_____

_____

(ii): _____

_____

_____

_____

28. Describe **two** ways in which technology has extended the shelf life of food products.

(i): _____

_____

_____

_____

(ii): _____

_____

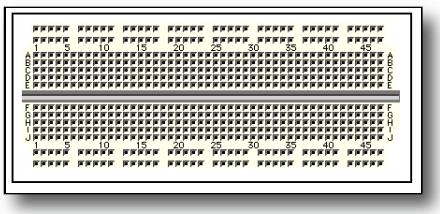
_____

_____

29. Identify the object shown

and

state clearly why it is used.



Object: _____

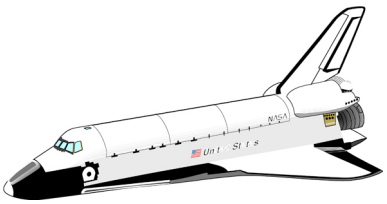
_____

Use: _____

_____

_____

30. State **one** reason why it was necessary to develop new materials in order to manufacture the space shuttle.



Reason: _____

_____

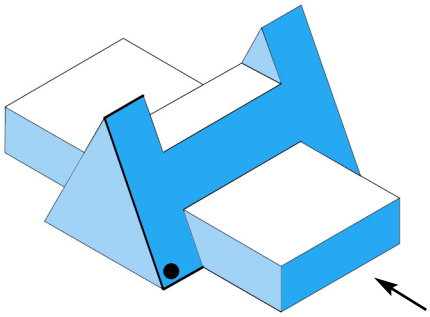
_____

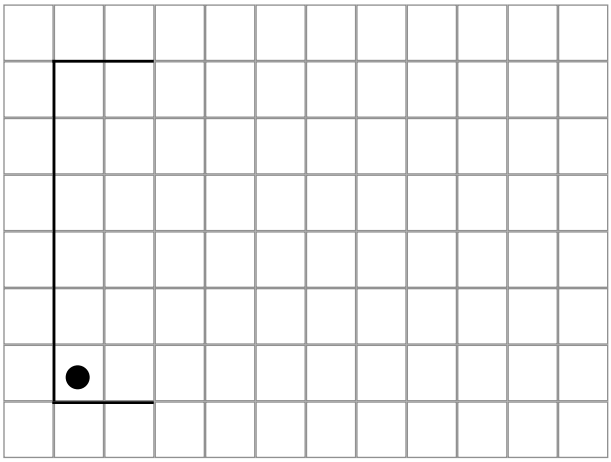
_____

_____

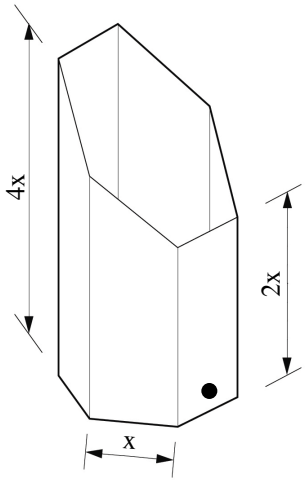
_____

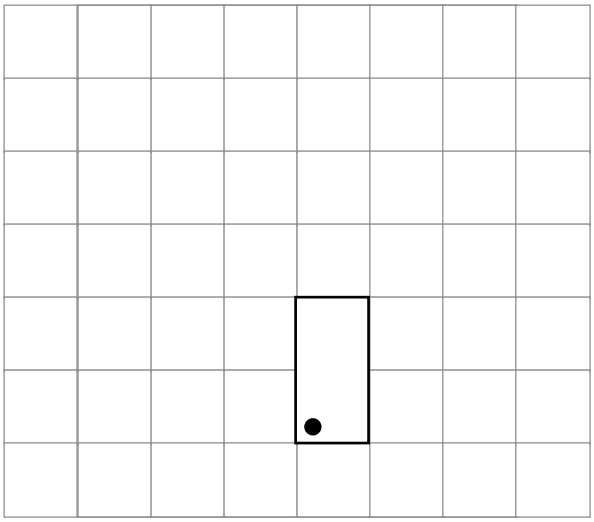
31. Complete the end view of the part shown.





32. Complete the development of the sides of the regular hexagonal based desk tidy shown.





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TECHNOLOGY

Junior Certificate Examination, 2008
HIGHER LEVEL

200 Marks

Wednesday, 18th June, Afternoon, 2:00 to 4:00

SECTION B and SECTION C

SECTION B - 50 Marks

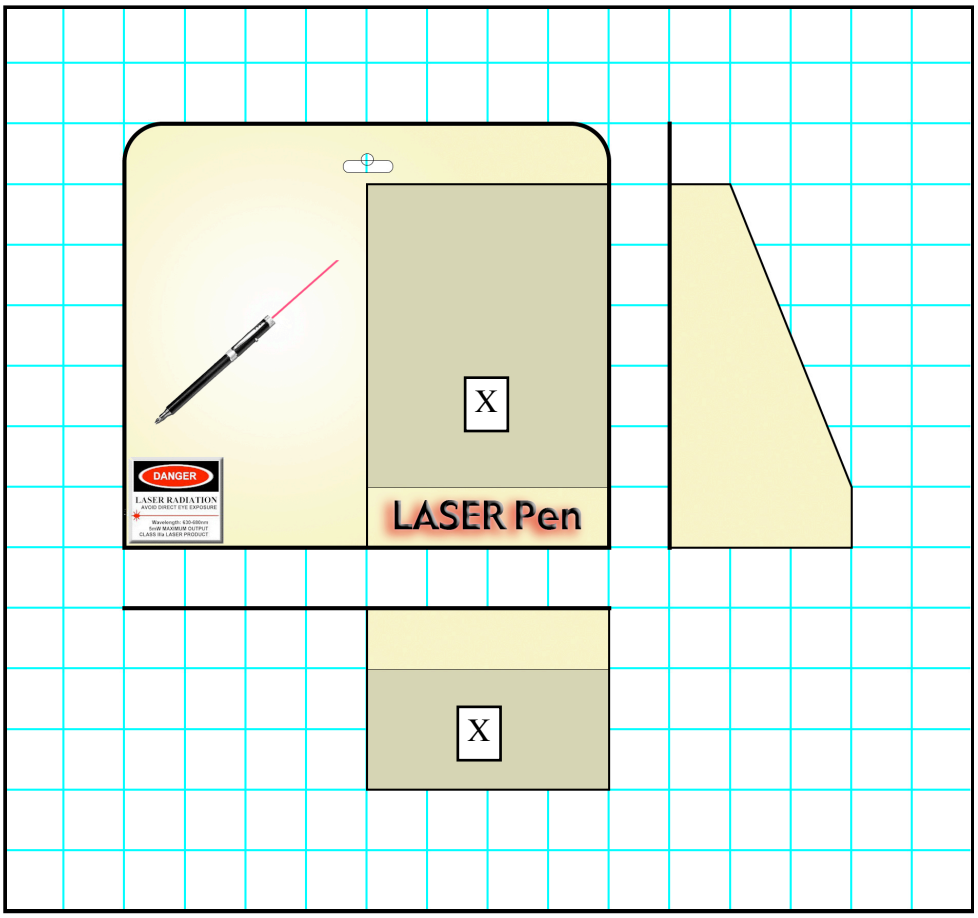
SECTION C - 50 Marks

INSTRUCTIONS

1. Answer **either (a) or (b)** from **each** question in Section B.
2. Answer **one** question from Section C.
3. Make sure to **hand up Section A** 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 student design, in plan, elevation and end view, for a laser pen display pack. The pack is manufactured from paper board and holds 12 laser pens.



(i) Sketch a well proportioned isometric view of the display pack on isometric grid paper.

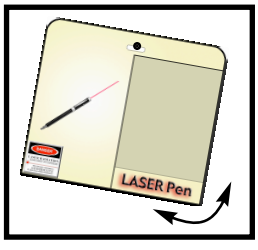
10 marks

(ii) 1. Sketch a design for a paper board tray, at 'X', to hold 12 laser pens upright in the display pack.

2. State **two** reasons why paper board is a suitable material for the manufacture of display packs.

10 marks

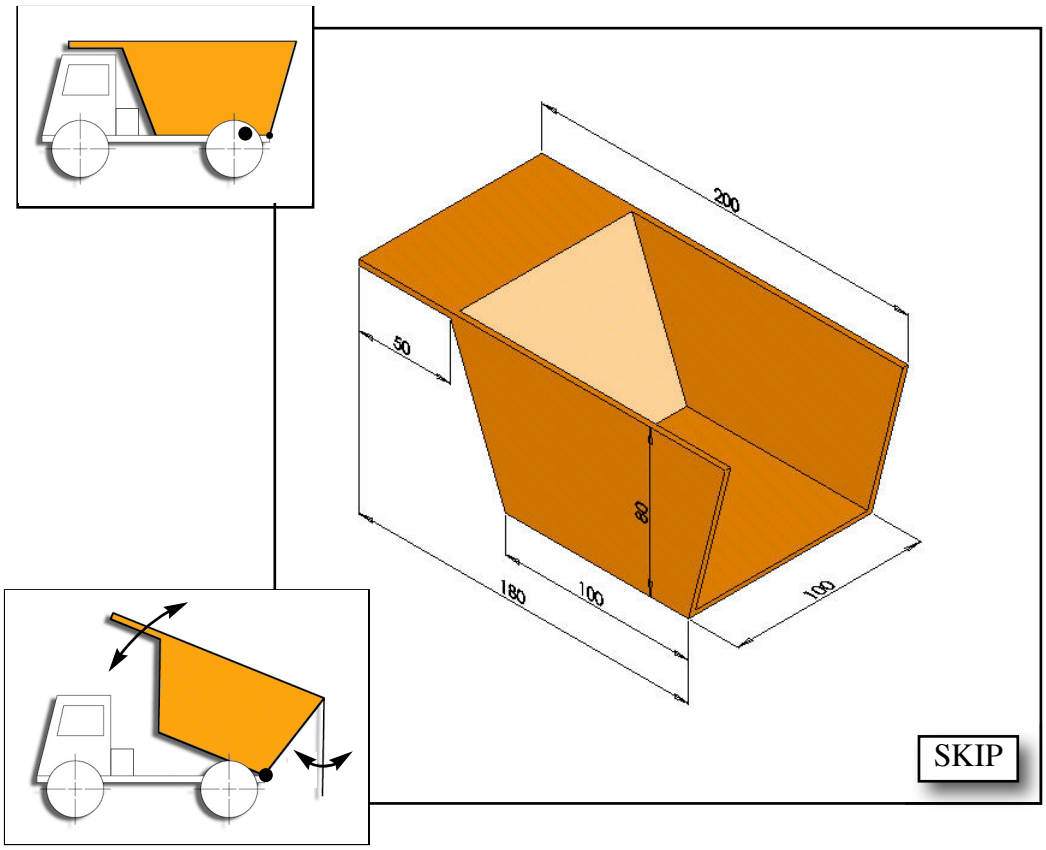
(iii) When hung at the attachment point, the display pack swung away from the vertical. Using a sketch, show how this design fault could be corrected.



5 marks

- OR -

1 (b) The sketch shows a student design for a toy tipper truck, with a skip.
The skip will be manufactured from acrylic.



All dimensions are in millimeters

(i) Using a suitable scale, sketch a development of the material required to manufacture the skip from a single sheet of acrylic.
Indicate clearly all bend lines and show the overall dimensions.

10 marks

(ii) 1. Name and sketch a suitable method of attaching a swing door to the rear of the skip.

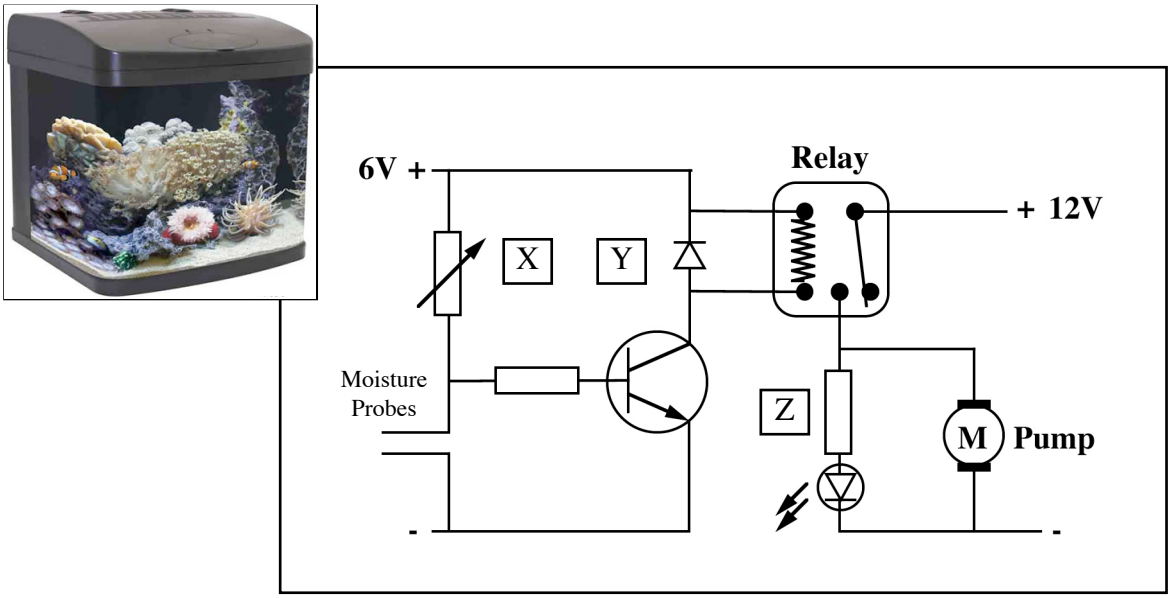
2. Name and sketch a suitable mechanism to raise and lower the skip on the truck.

10 marks

(iii) Sketch **two** safety features which should be included in this student design.

5 marks

2 (a) The circuit shown is designed to turn on a water pump if low water levels are detected in a fish tank.

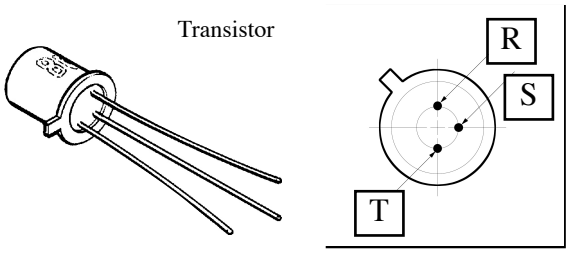


(i) 1. Identify the component labelled 'X' and state the function of this component in the circuit.

2. Explain how the circuit would function if component 'X' and the moisture probes were interchanged in the circuit.

3. Identify the component labelled 'Y' in the circuit.

(ii) 1. Which one of the pins labelled 'R', 'S' or 'T' is the emitter of the transistor shown?



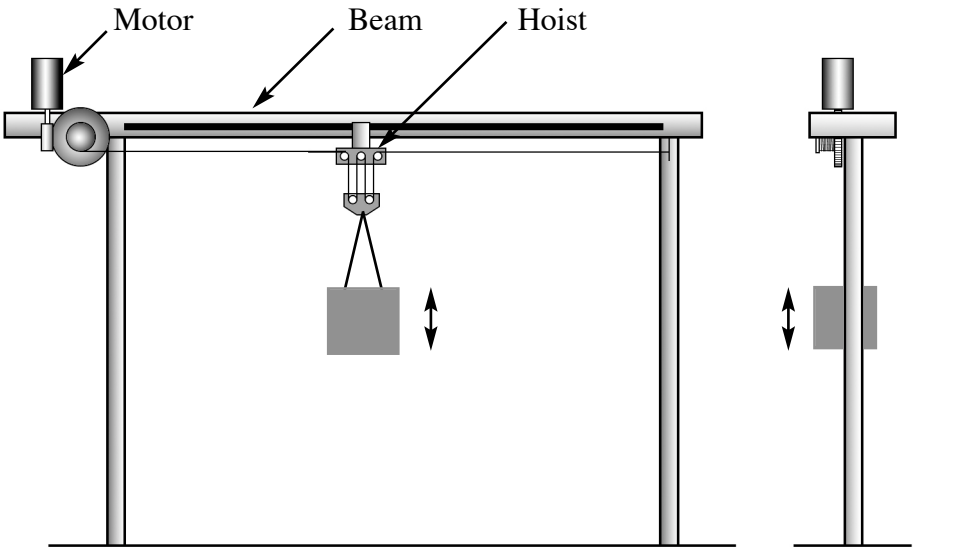
2. Name the type of relay shown in the circuit above and explain why a relay is required in the circuit.

3. Calculate the required value for resistor 'Z' from the following LED data: LED V_f = 2V and LED I_{max} = 20mA.

25 marks

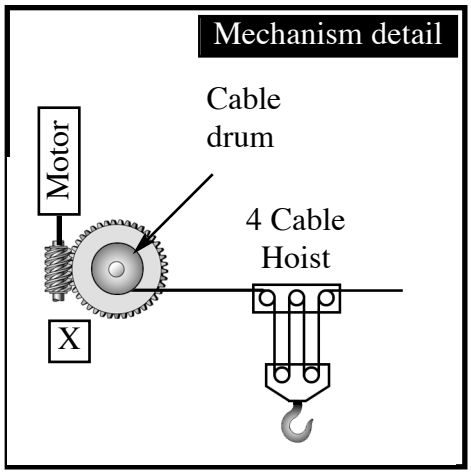
- OR -

2 (b) The sketch shows a student design for a motorised hoist on a gantry crane.



Front Elevation of Gantry Crane

Side Elevation



(i) 1. Name the mechanism attached to the motor at 'X'.

2. State **two** advantages to the mechanism at 'X' over a compound gear system.

3. State **two** advantages of using the **four cable** hoist, as shown above.

15 marks

(ii) Sketch a mechanism which will move the hoist along the beam.

5 marks

(iii) The gantry crane structure shown above is unstable.

Sketch **two** structural features which will increase the stability of the crane.

5 marks

Section C - 50 Marks

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

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

3. Technology and Society

The design of modern mobile phones has changed dramatically since they were first introduced.

(a) (i) Describe **one** technological advance which made these design changes possible.

(ii) Describe **one** additional function available only in modern mobile phones.

10 marks

The technologies of GPS, GSM, Sat Nav, DVD, MP3 and USB are in common use.

(b) (i) Explain the meaning of any **two** of these technological terms.

(ii) For each of the **two** selected terms, outline the advantages of these new technologies.

20 marks

Scientists have warned that fossil fuels are a dwindling resource.

(c) Outline **two** other problems associated with the continued use of fossil fuels.

10 marks

(d) Outline the alternative fuel sources which could be used to provide for the following:

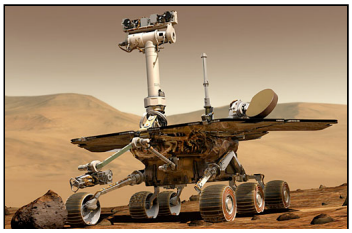
(i) public and private transport,

(ii) electrical supply to industry and homes.

10 marks

4. Control Systems & Technology and Society

Robots are commonly used in industry and in planetary exploration.



(a) (i) Explain **where** and **why** robots are used in industry.

(ii) Explain how the actions of industrial robots are **controlled** and **modified**.

(iii) Outline **two** differences between robots used in industry and in planetary exploration.

(iv) Outline **two** other applications of robotics.

40 marks

Manufacturing jobs in Ireland are frequently lost to developing countries.

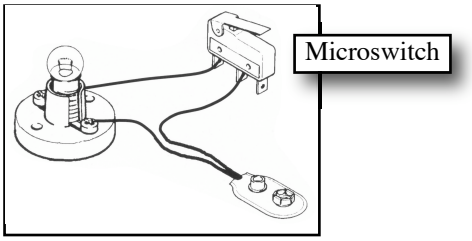
(b) (i) Explain why jobs are being transferred to other countries.

(ii) Outline the type of skills required by the Irish workforce to maintain employment in Ireland.

10 marks

5. Design and Manufacture

A student is required to manufacture a model lighthouse with a flashing light based on the design shown.



(a) Describe, with the aid of suitable sketches, the steps required to manufacture the main lighthouse structure from a suitable material.
Name **three** tools and processes required to manufacture the lighthouse structure.

20 marks

(b) (i) Describe, with the aid of suitable sketches, a motorised mechanical system to activate the flashing light by opening and closing the microswitch.

(ii) Explain how this mechanical system could be modified to change the number of light flashes per minute.

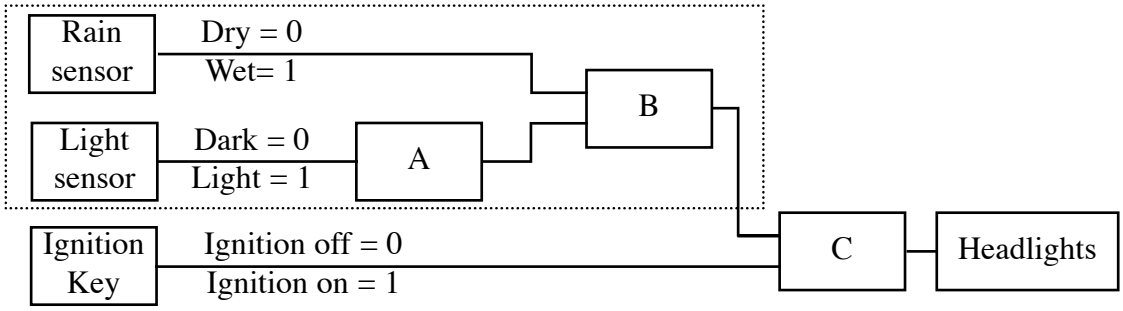
(iii) Describe, with the aid of suitable sketches, how this motorised mechanical system could be activated automatically at nightfall.

30 marks

6. Control Systems

A block diagram for a motor car safety system is shown.

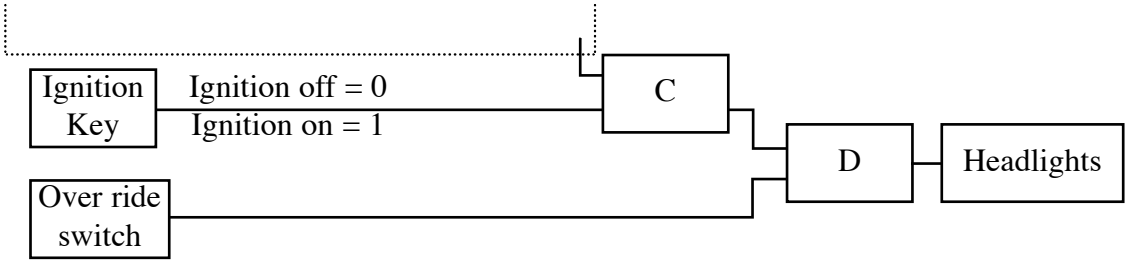
The system will automatically switch on the car headlights when it is dark or when it rains. The system will operate only when the ignition key is turned on.



(a) (i) Identify the logic gates required at A, B and C.

(ii) Sketch and complete a truth table for logic gates A and C.

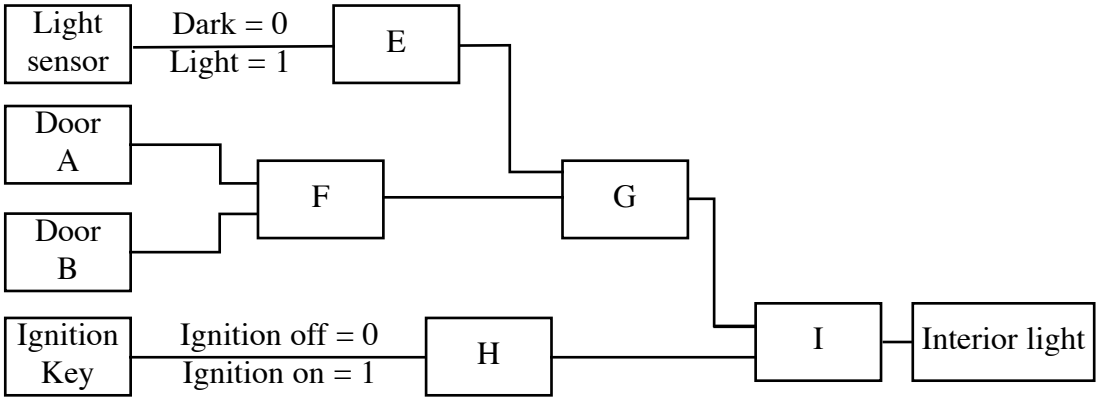
(iii) The block diagram below shows a modification to this system to allow the driver switch on the lights when required.



(iv) Name the gate required at 'D' and explain why the system will work with the selected gate.

30 marks

(b) A second system is required to turn on the interior light at night, if either the driver door or the passenger door is opened. The interior light must turn off if the ignition key is turned on.



Name the gates required at E, F, G, H and I for this system.

20 marks