



Leaving Certificate Examination

Technology
Ordinary Level

Friday, 19 June
Afternoon, 2:00 - 4:00

Section B - Core (48 marks)

Answer both questions.

Each question in Section B carries 24 marks.

Section C - Options (80 marks)

Answer two of the five options presented.

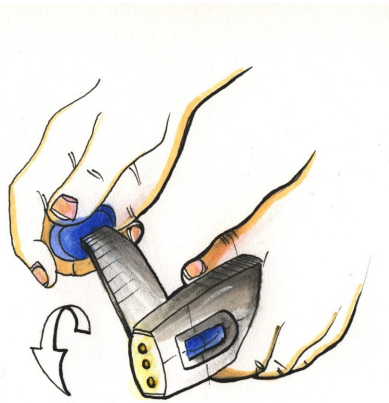
All questions in Section C carry 40 marks.

Instructions:

- (a) *Answer these questions in the answerbook provided.*
- (b) *Write your examination number on the answerbook.*
- (c) *Draw all sketches in pencil.*
- (d) *Hand up the answerbook at the end of the examination.*

Section B - Core *Answer Question 2 and Question 3.*

Question 2 - Answer 2(a) and 2(b)

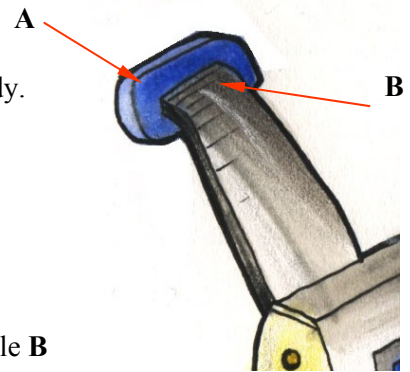


2(a) The self-powered torch is powered by a manually operated internal generator as shown in the sketch. A compound gear train is used in conjunction with the generator.

- (i) State the function of the compound gear train.
- (ii) A decision was made to use 3 LEDs in the torch instead of a tungsten filament bulb. Give **two** reasons for this decision.

2(b)

- (i) Name a suitable manufacturing process for the body of the self-powered torch. Name a suitable plastic for the torch body. Give **two** reasons for your choice of plastic.
- (ii) Identify **two** energy conversions taking place in the torch.
- (iii) Describe using notes and annotated sketches:
 - 1. A suitable shape for grip A.
 - 2. An appropriate method of attaching grip A to the handle B so as to ensure ease of use.



Answer 2(c) or 2(d)

2(c)

- (i) Gantt charts can play a critical role in the overall management of a project. List **two** functions of a Gantt chart.
- (ii) In manufacturing products such as the self-powered torch, the quality of the finished product can often be directly related to its cost.
Discuss this statement giving **two** possible benefits of purchasing a product that is more expensive.

OR

2(d)

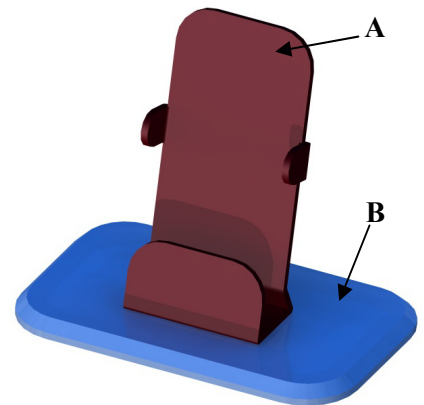
- (i) Give **two** examples of energy efficient products or devices which have contributed to sustainable use of energy.
- (ii) Explain how self-powered electrical devices can help reduce the demand for energy from non-renewable sources.
Give **two** limitations of self-powered electrical devices.

Question 3 - Answer 3(a) and 3(b)

3(a)

The graphic shows a design for a mobile phone holder. Part A is made from a single piece of acrylic and part B is to be made from another suitable material.

- (i) Suggest a suitable material for the base B and give **two** reasons for your selection.
- (ii) Describe, using notes and sketches, a suitable method of joining part A to part B without using adhesives.



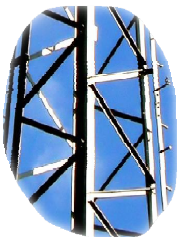
3(b)

- (i) Draw a well proportioned freehand sketch of the development of part A, indicating **all** fold lines.
- (ii) A light emitting diode (LED) is required to indicate that the mobile phone is resting in its holder. Draw a suitable circuit diagram to achieve this. Label all components.
- (iii) Soldering is used to form the joints when connecting electrical components. State the function of **flux** when soldering and outline **two** safety precautions to be observed when using a soldering iron.

Answer 3(c) or 3(d)

3(c)

- (i) The erection of mobile phone masts in prominent places can be a cause of concern for many people. Discuss **one** advantage, and **one** disadvantage of the erection of such masts.



- (ii) The mast shown uses *triangulation* in its construction. Describe using notes and annotated sketches the principle of triangulation.

OR

3(d)

- (i) State **two** positive and **two** negative impacts that mobile phone technology can have on today's society.
- (ii) Designers use freehand sketches to produce initial design drawings for their products. Suggest **two** advantages of freehand sketching at the design stage.



Section C - Options - Answer any two of the Options

Option 1 - Applied Control Systems - Answer 1(a) and 1(b)

1(a)

- (i) A Peripheral Interface Controller (PIC) can be described as a *programmable chip*. Give **one** advantage of a *programmable chip* over an integrated circuit.
- (ii) Give **two** examples of where PICs are used in everyday life.



1(b)

- (i) Outline **one** reason why flowcharts are used when writing a program for a PIC.
- (ii) Two commands used in a flowchart for a PIC controlled system are shown at **A** and **B**. Outline the function of **each** command.

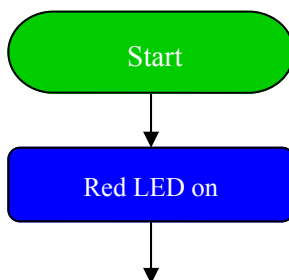


A



B

- (iii) Two LEDs (one red and one green) are to be used as part of a shop window display. A PIC is to be used to control the lighting sequence of the LEDs. Complete the flowchart shown below, using labelled cells, to turn the LEDs on and off in the following sequence:



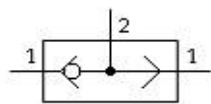
- Switch on the red LED for 3 seconds, and then switch it off
- Wait for 2 seconds
- Switch on the green LED for 2 seconds, and then switch it off
- Wait for 2 seconds
- Repeat this process continuously.

Answer 1(c) or 1(d)

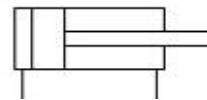
1(c)

Compressed air is used in pneumatics to perform a variety of tasks.

- (i) Give **two** advantages of using pneumatics in industrial situations.
- (ii) Name the pneumatic components **A** and **B** below and describe how each one works.



A



B

OR

1(d)

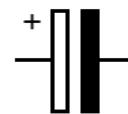
- (i) Robotic systems have dramatically affected our everyday lives. Outline **one positive** and **one negative** contribution robots have made in the manufacturing industry.
- (ii) Explain the following terms associated with robotics:
 - Degrees of freedom
 - End effectors.



Option 2 - Electronics and Control - Answer 2(a) and 2(b)

2(a)

The graphics show a capacitor, and its electronic symbol.

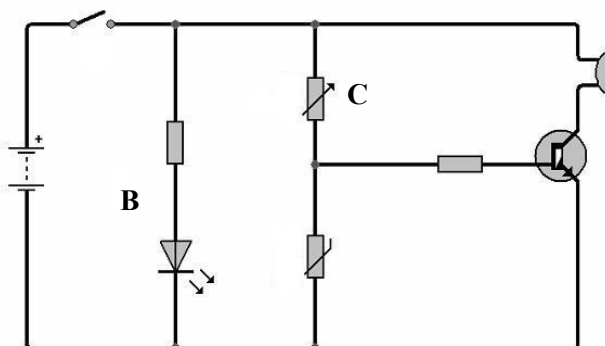


- (i) State the unit of measurement of capacitance.
- (ii) Explain briefly how an electrolytic capacitor works.

2(b)

The transistor circuit shown is used to sound an alarm when low temperatures are detected.

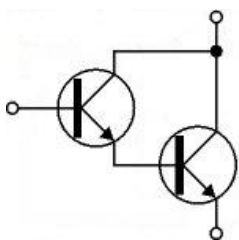
- (i) What are the functions of the resistor and the LED at **B** in the circuit.
- (ii) Name component **C** and explain its function in the circuit.
- (iii) Redraw the circuit to show how high temperature could be detected.



Answer 2(c) or 2(d)

2(c)

The graphic shows two electronic components linked together in a specific arrangement.

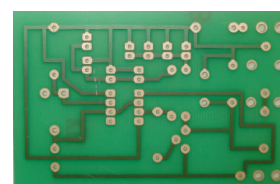


- (i) Name this arrangement.
- (ii) State the function of this arrangement and redraw the circuit at 2(b) to show how it would be incorporated.
- (iii) What effect would the addition of this arrangement have on the operation of the circuit at 2(b).

OR

2(d)

- (i) State **two** advantages of constructing a circuit on a printed circuit board (PCB).
- (ii) Describe **one** method of producing a PCB in the Technology Room having due regard to current health and safety regulations.



Option 3 - Information and Communications Technology - Answer 3(a) and 3(b)

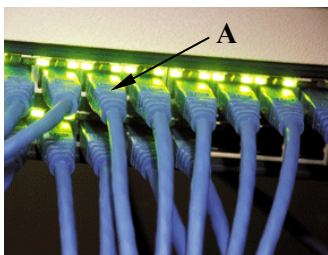
3(a)

- (i) List **three** factors which would influence your choice when purchasing a home computer.
- (ii) In terms of memory, explain the difference between ROM and RAM.



3(b)

There are many factors to be considered when installing a network in a building such as a school.



- (i) Name the type of connector shown at **A**.
- (ii) Outline **three** factors that affect the choice of cable for a particular network installation.
- (iii) Infrared (IR) and Radio Frequency (RF) are two types of wireless transmission used in networks. Outline the differences in the way they work and give **one** example of where **each** type might be used.
- (iv) List **two** security risks when transferring files over a wireless network.

Answer 3(c) or 3(d)

3(c)

Image **X** has been edited using photo editing software to produce image **Y**.
Image **Y** will be used in a printed report.



X



Y

- (i) State **three** commands used to edit the image.
- (ii) Suggest an appropriate file format to save the edited image.
Outline **two** reasons in support of your choice.

OR

3(d)



- (i) State the meaning of the term *compression* in relation to MP3 files.
- (ii) *“Illegal music downloading is contributing to a decline in music industry development.”*

Discuss this statement, giving **two** points in support of the opinion outlined and **two** points against.

Option 4 - Manufacturing Systems - Answer 4(a) and 4(b)

4(a)

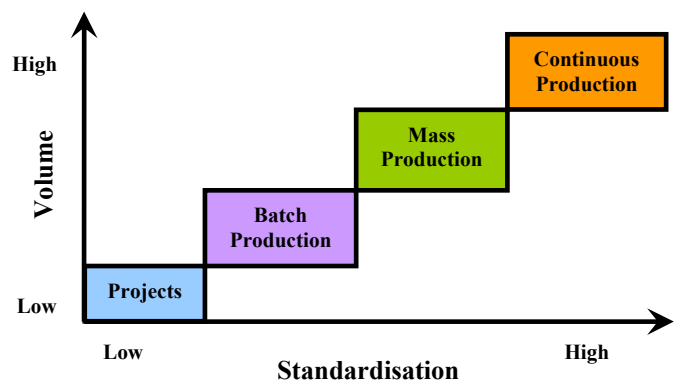
- (i) Running shoes are often manufactured in developing countries such as China.
Give **one** reason why this is so.
- (ii) Give **two** negative effects on the environment caused by transporting goods long distances to their markets.



4(b)

Imagine that you are setting up a manufacturing system to make running shoes. You expect there will be a high demand for the shoes.

- (i) Using the diagram shown, choose a suitable type of production process.
Give **one** reason for your answer.
- (ii) Your manufacturing department is part of a large company. Name **two** other departments in the company. In each case, describe **one** important task they perform in relation to the production of the running shoe.
- (iii) Sports shops will not sell the shoes unless they are certain that they are of high quality.
Describe **three** key features of a system you would put in place to ensure that the shoes are of high quality.

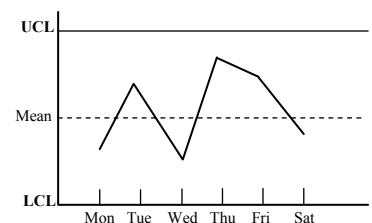


Answer 4(c) or 4(d)

4(c)

The quality of the stitching on the shoe is important. The control chart shown records the number of faults found over a week.

- (i) What is meant by the terms **UCL** and **LCL**?
- (ii) What does the chart tell you about the quality of the stitching process?

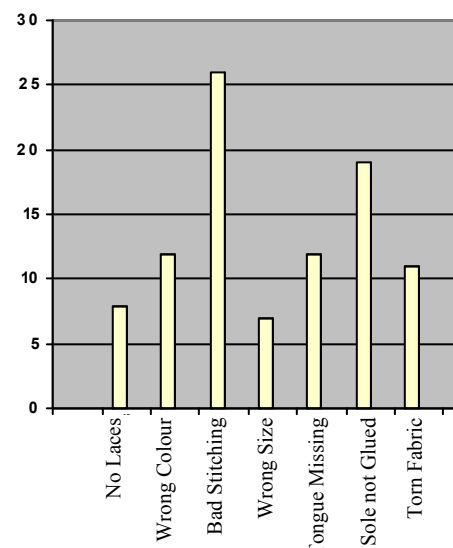


OR

4(d)

The bar chart shows the quality problems in the manufacture of the running shoe that occurred over one week.

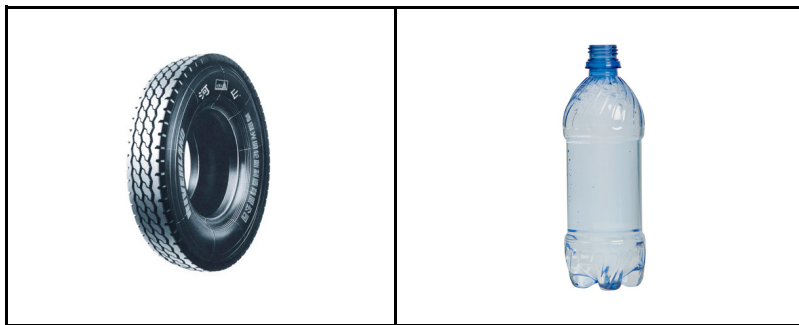
- (i) Which **two** areas contribute most to the quality problems?
- (ii) Describe a quality problem solving method that you would use to investigate **one** of these problem areas.



Option 5 - Materials Technology - Answer 5(a) and 5(b)

5(a)

The graphics show a tyre and a water bottle.

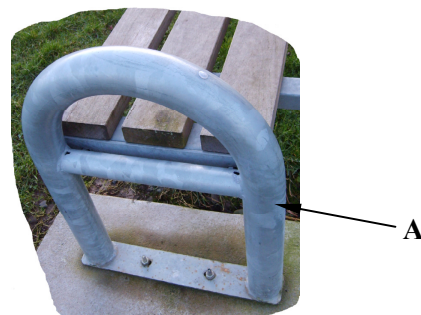


- (i) Name a suitable material for the manufacture of **each** item.
- (ii) In **each** case, outline **two** properties of the material which make it suitable for the product.

5(b)

The graphics below show a garden seat and a detail of its end frame A.

- (i) Choose a suitable wood for the manufacture of the garden seat and justify your choice.
- (ii) Identify **one** permanent and **one** semi-permanent joining method used in the garden seat. In **each** case, outline why the method of joining is appropriate.
- (iii) The support A is made from tubular mild steel. Why is tubular mild steel a suitable material for the support?



Answer 5(c) or 5(d)

5(c)

- (i) A moulded edge has been applied to the rails of the seat using a router. Sketch a suitable profile for the moulded edge and justify your selection. List **two** safety precautions to be taken into account when using an electric router.
- (ii) Name a metal other than tubular mild steel that would be suitable for the manufacture of the support A. Give **one** advantage and **one** disadvantage of this metal.

OR

5(d)

- (i) Name an appropriate surface treatment and describe how it would be applied to the tubular steel bench supports.
- (ii) Describe how students can reduce the adverse environmental impact of a project by their choice of materials.

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