



*Leaving Certificate Examination*

# *Technology*

## *Ordinary Level*

*Sample Paper*

*Duration 2:00 hours*

### ***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.*

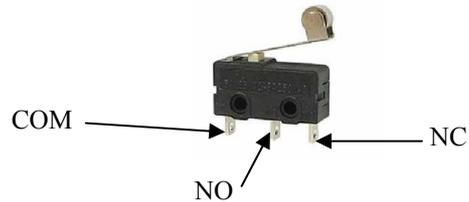
## **Section B - Core** *Answer Question 2 and Question 3.*

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

**2(a)**

A cat flap is fitted to a door as shown below. Coloured LEDs indicate whether a cat is in or out.

Two microswitches are used to activate the LED circuit, one on the inside and one on the outside of the cat flap.



- (i) Explain the following abbreviations; COM, NO, and NC shown on the microswitch above.
- (ii) Draw a circuit diagram to show how the microswitch can be used as a push-to-make switch. Label the poles of the microswitch.

**2(b)**

- (i) A housing for the LED display is to be fixed to the door near the cat flap. Make a neat freehand sketch of a housing design suitable for the LED display.
- (ii) Choose suitable materials for the manufacture of your design and justify your choice of materials.
- (iii) Outline, in their correct sequence, the main steps in the making of your chosen design for the housing. Use sketches where appropriate.

### **Answer 2(c) or 2(d)**

**2(c)**

You wish to research existing designs of cat flaps.

- (i) Discuss the advantages of using the Internet as a research tool to find a number of suitable images of cat flaps.
- (ii) The dimensions of an image you have found are too big to fit on your page. Describe the steps you would take to reduce the dimensions of the image in order to insert it into your design folio.

**OR**

**2(d)**

- (i) Outline the advantages of using Project Management techniques.
- (ii) Give two examples of where Project Management techniques are used by large companies.

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

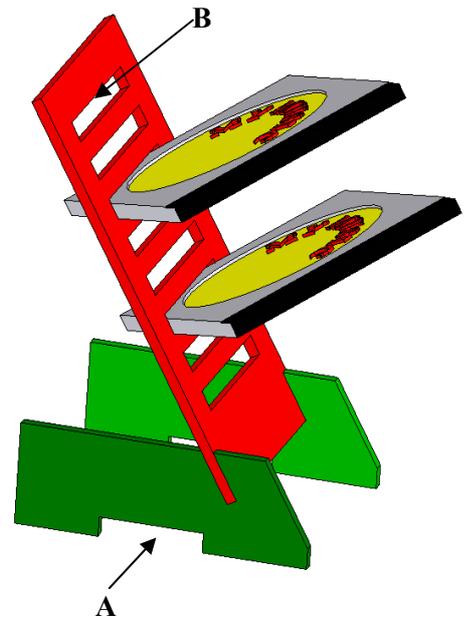
**3(a)**

The 3D graphic shows a compact disc (CD) rack made from acrylic.

- (i) Make a well proportioned 2D freehand sketch of the CD rack when viewed parallel to the direction of arrow A.

*Note: It is not necessary to include the CDs in your sketch.*

- (ii) Apply suitable rendering to your sketch.



**3(b)**

- (i) Name three manufacturing processes which could be used in making the CD rack.
- (ii) A CD case is 142 mm x 125 mm x 10 mm. Suggest suitable dimensions for slot B to accommodate the CDs.
- (iii) Outline, in their correct sequence, the steps in making slot B. Use sketches where appropriate.

**Answer 3(c) or 3(d)**

**3(c)**

When completed, it was found that the CD rack was unstable.

- (i) Identify one possible reason for this instability.
- (ii) Outline **one** design modification which would help solve this problem. Use sketches where appropriate.

**OR**

**3(d)**

- (i) Describe three ways in which Information and Communications Technology (ICT) can enhance the presentation of a student's design folio.
- (ii) Explain why is it important to evaluate the completed artefact against the design brief.

# Section C - Options - Answer any two of the Options

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

1(a) The image shows a PIC.



- (i) What is meant by the abbreviation PIC?
- (ii) The image shows a microwave oven which uses a PIC.

Explain why a PIC is used in such an appliance.

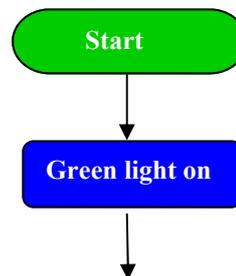


1(b)

- (i) Explain any **two** of the following terms associated with robotics:
  - Degrees of freedom
  - End effectors
  - Work envelope
- (ii) A PIC control system is used to control a set of traffic lights as shown. The lights are to be switched on and off in the following sequence:
  - Switch on the Green light for 10 seconds, and then switch it off
  - Switch on the Amber light for 2 seconds, and then switch it off
  - Switch on the Red light for 12 seconds, and then switch it off
  - Repeat the sequence continuously



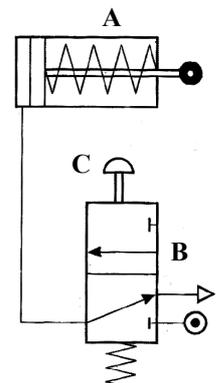
Complete the program shown to control the lights.



Answer 1(c) or 1(d)

1(c)

- (i) Pneumatic systems incorporate the use of compressed air to perform a variety of tasks.  
Name **two** areas where pneumatic systems are used.
- (ii) Identify the components marked **A** and **B** in the pneumatic circuit shown and explain what happens when button **C** is pressed.



OR

1(d)

Robotic systems are used for a wide range of applications.

- (i) Describe two tasks commonly carried out by robots.
- (ii) For each task described above, explain why robots are used instead of humans.

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

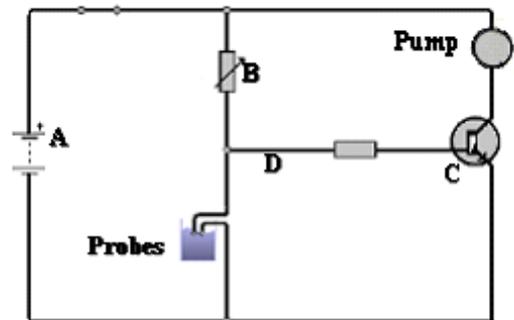
2(a) The graphics show a diode and a Light Emitting Diode (LED).



- (i) Outline how the cathode is identified in each component.
- (ii) What property do all diodes have in common?

2(b) The graphic shows a circuit diagram for a pump which operates automatically when dry soil is detected by probes.

- (i) Name the components **A**, **B** and **C** in the circuit.
- (ii) Explain how the voltage at **D** in the circuit is regulated.
- (iii) What is the effect of swapping the positions of component **B** and the probes in the circuit?



Answer 2(c) or 2(d)

2(c)

- (i) Recommend a suitable material for the probes in the above circuit.
- (ii) Outline the properties which make the material suitable for use as a probe.

OR

2(d)

- (i) Name an electrical component found in the Technology room in which the principle of electromagnetism is used.
- (ii) Explain the term *right hand rule* when describing the relationship between electric current and magnetism.

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

- 3(a) (i) Name two computer operating systems.
- (ii) List two functions of a computer operating system.

3(b) The image shows a classroom in which a LAN is used.

- (i) Explain the abbreviation LAN.
- (ii) Give three advantages of using a LAN in a computer room.
- (iii) A LAN may be either *peer-to-peer* or *client server*. Explain one of these LAN types. Use a simple diagram to illustrate your answer.



Answer 3(c) or 3(d)

3(c)

The image shows a computer motherboard.

- (i) Explain the abbreviation CPU.
- (ii) Name three components found on a motherboard.
- (iii) Outline the function of each component.



OR

3(d)

In 2007 Irish consumers spent an estimated €400 million on eBusiness through the Internet.

- (i) Name a widely used eBusiness website.
- (ii) *Identity theft* is a serious concern for people who purchase items using the Internet. Outline three ways in which a person can reduce the risk of identity theft when using the Internet.

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

**4(a)** Batch production, mass production and one-off are systems for manufacturing products.

Choose the most suitable production system for the following:

- (i) A small baker's shop providing fresh bread every morning.
- (ii) An electronics company making a large number of mobile phones.



**4(b)**

The table shows the daily batch output from a small bakery making different types of bread.

- (i) Draw a bar chart to show the quantity of each product baked.
- (ii) Calculate the average baking time per batch.
- (iii) The oven is rated at 3 kW. The oven runs for 4 hours per day and electricity costs 15 cent per kW/hr.  
Find the cost of running the oven for a 7 day period.

Product	Quantity baked	Baking time
White loaves	20	15 min
Sliced pan	30	15min
Rolls	50	6 min
Brown loaves	10	19 min
Scones	60	10 min

*Answer 4(c) or 4(d)*

**4(c)**

- (i) Explain the difference between a *quality characteristic* and a *quality attribute*.
- (ii) A bakery wishes to monitor two quality characteristics and two corresponding quality attributes.  
Suggest two quality characteristics and corresponding quality attributes which could be monitored.

**OR**

**4(d)**

- (i) Explain the term *outsourcing*.
- (ii) Successful companies often compete with one another on the basis of:  
*cost; quality; flexibility; speed.*

List two successful Irish companies and, using the above points as a guide, explain why **each** of the companies listed is successful.

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

5(a)

- (i) Suggest a suitable material for the manufacture of any **two** of the following products. List one property that makes the material suitable in each case.



- (ii) Materials are often categorised by their properties. List three properties that can determine the category of a material.

5(b) A bird house made from solid wood is shown below.



- (i) Mechanical jointing is used for joining the sides of the birdhouse to each other. Explain, using sketches, the term *mechanical jointing*.
- (ii) List two advantages and two disadvantages of *mechanical jointing* as a method of fixture.
- (iii) Sketch one method for joining sides A and B which does not use nails or screws.

Answer 5(c) or 5(d)

5(c)

- (i) Choose a surface treatment to protect the wood and describe how it would be applied to the birdhouse.
- (ii) Softwoods treated with preservatives are used more frequently than hardwoods in the manufacture of garden products. Discuss the reasons why treated softwoods are used for garden products.

OR

5(d)

- (i) A mild steel chain is used to hang the birdhouse from a tree. Suggest a suitable surface treatment for the mild steel chain and outline how it would be applied.
- (ii) Using notes and sketches show how the mild steel chain could be attached to the roof of the birdhouse.

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