

M.72

**AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA
LEAVING CERTIFICATE EXAMINATION, 2000**

ENGINEERING - MATERIALS AND TECHNOLOGY
(Ordinary Level - 200 marks)

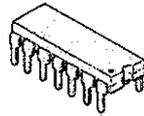
THURSDAY, 22 JUNE - AFTERNOON 2.00 to 4.30

Answer **Question 1, Sections A and B**, and **any three** other questions.

OVER ®

SECTION A - 30 marks

Give **brief** answers to **any six** of the following:

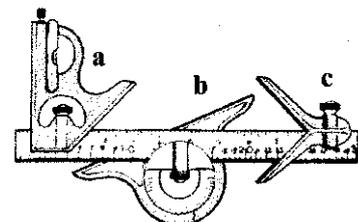


- (a) Name the electronic component shown.
- (b) Give an example of work hardening in a metal.
- (c) What is an alloy?
- (d) Name the gauge opposite and give an application for its use.
- (e) What is the essential difference between ferrous and non-ferrous metals?
- (f) Name suitable fluxes which may be used when soldering
(i) wires in an electrical circuit; (ii) two pieces of brass (hard soldered).
- (g) How are voltage and current measured in an electrical circuit?
- (h) Name **two** computer output devices.

**SECTION B - 35 marks**

Answer **any three** of the following:

- (i) Describe the function and operation of **any one** of the following:
(i) Electric soldering iron; (ii) Plastics dip coating tank; (iii) Thermistor.
- (j) Explain **any two** of the computing terms:
Browser, Icon, Graphics, Software, Off-Line.
- (k) What is meant by the term Computer Numerical Control (CNC)?
- (l) Explain **any two** of the terms:
Ductility, Insulator, Resistor, Pitch.
- (m) Name the gauge shown and give an application for (a), (b), (c).



2.

(45 marks)

- (a) Explain the following heat treatments and give an example of the circumstances in which each is used:
- (i) Annealing; (ii) Normalising; (iii) Hardening; (iv) Tempering.
- (b) The jaws of a mild steel spanner must be prevented from wearing in use. Describe the heat treatment used to do this.
- (c) Explain the term *flame hardening* and give an application for its use.

3.

(45 marks)

- (a) State the type of furnace used to produce each of the following materials:
- (i) Pig iron; (ii) Mild Steel; (iii) Cast Iron.
- (b) Explain the following terms and name the materials with these properties.
- (i) Brittleness; (ii) Ductility.
- (c) State with reasons, the material you would recommend for making the following:
- (i) The bit of a soldering iron; (ii) The bed of the centre lathe.

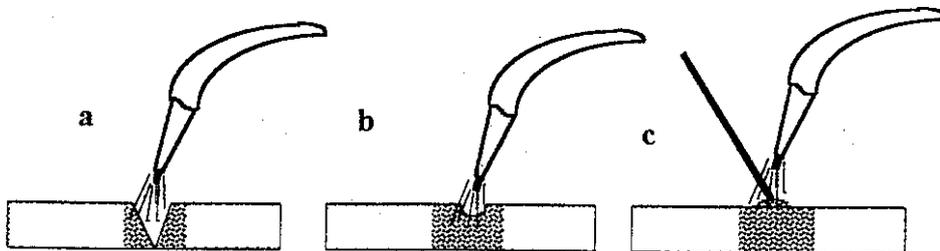
OR

- (c) Explain any **three** of the following CNC terms:
- (i) tool off-sets; (ii) stepper motor;
(iii) canned cycle; (iv) part programme;
(v) peck drilling.

4.

(45 marks)

- (a) Describe the welding stages in a, b and c.



- (b) Name the welding process taking place.
- (c) Name **two** other welding processes and describe **one** with the aid of a line diagram.
- (d) Why is a resin flux used in the soldering of electrical connections?

OVER ®

5.

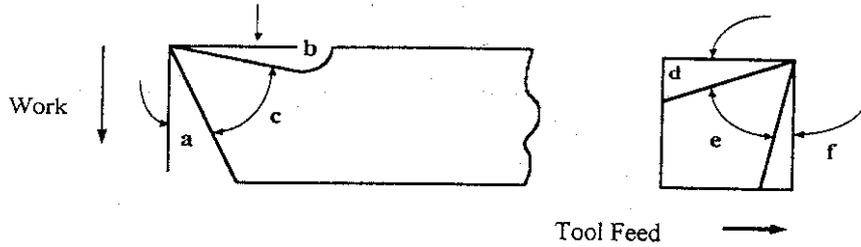
(45 marks)

- (a) Describe the extrusion **or** blow moulding process for producing plastic components and identify a product from **each**.
- (b) List the following plastics under the heading of 'thermoplastics' or 'thermosetting' plastics and explain why they are classified as such:
 - (i) Acrylic (Perspex); (ii) Polyester resin; (iii) Polystyrene; (iv) Polyurethane.
- (c) Name the plastics usually associated with the following applications:
 - (i) Bearings; (ii) Packaging Insulation; (iii) Raincoats.

6.

(45 marks)

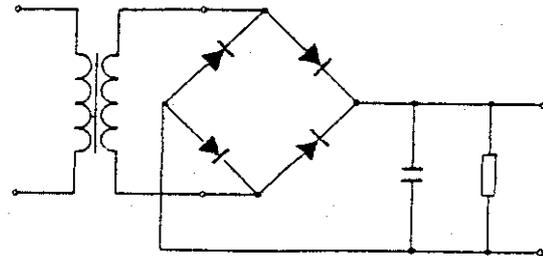
- (a) Identify the tool angles a, b, c, d, e, f



- (b) Explain the function of the following lathe components:
 - (i) Compound slide; (ii) A combination drill; (iii) A knurling tool.
- (c) Name **two** safety precautions to be observed when operating the centre lathe.

OR

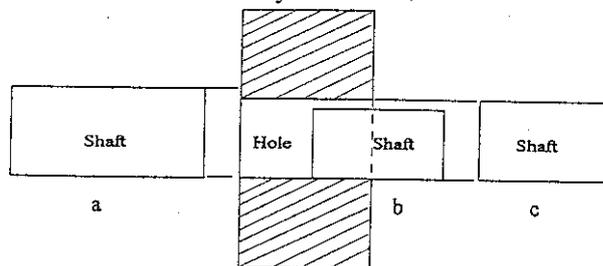
- (c) Explain how the power supply circuit shown in the diagram operates.



7.

(45 marks)

- (a) Name the type of fits used in the hole basis system for a, b and c.



- (b) A shaft is to be made to the dimensions $50\text{mm} \pm 0.06$, state:
 - (i) The nominal dimension; (ii) The upper limit; (iii) The tolerance.
- (c) Explain the terms: (i) bilateral and (ii) unilateral tolerance.

OR

- (c) Explain any two of the following terms:
 - (i) Transistor; (ii) Gap Gauge; (iii) Work hardening.