

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA
LEAVING CERTIFICATE EXAMINATION, 1999

M.72

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

3754

FRIDAY, 25 JUNE - AFTERNOON 2.00 to 4.30

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

1.

(65 marks)

SECTION A - 30 marks

Give brief answers to any six of the following:

- (a) Name the electronic component shown.



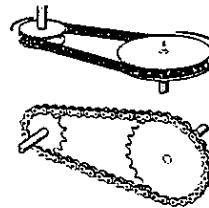
- (b) What property makes polystyrene suitable for hot drink containers?

- (c) What are the advantages of reaming after drilling?

- (d) Describe two methods for locking nuts.

- (e) Describe two safety precautions to be observed when using a "Plastics Dip Coating Tank".

- (f) Name the two drive types shown:



- (g) State two uses for a centre lathe tailstock.

- (h) Name two computer input devices.

SECTION B - 35 marks

Answer any three of the following:

- (i) Describe the function and operation of any one of the following:

Multimeter; Strip Heater; Solar Panel.

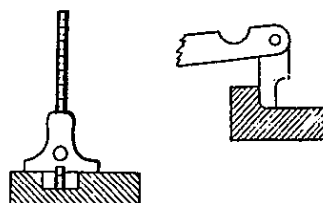
- (j) Explain any two of the computing terms:

CPU, e-mail, Output Device, ROM.

- (k) Define *transition* as used in a system of limits and fits.

- (l) Explain any two of the terms: Brittleness; Magnetic Switch; Conductor; Compressor.

- (m) Name the two gauges shown:



2.

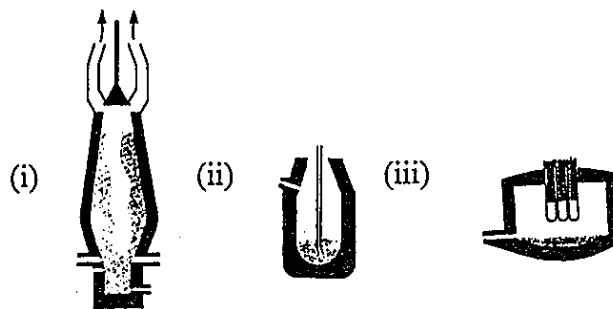
(45 marks)

- (a) Explain the essential difference between *elasticity* and *ductility*.
- (b) Describe the heat treatment necessary to produce a hard surface on a screwdriver blade, made from mild steel.
- (c) Suggest suitable heat treatments for the following:
 - (i) A copper dish which is to be hollowed;
 - (ii) A lathe bed which needs to withstand wear;
 - (iii) A cold chisel for the workshop.

3.

(45 marks)

- (a) Name the furnaces shown:



- (b) Describe the operation of any one furnace and the type of material produced.
- (c) Name the ores from which aluminium and lead are produced.
- (d) Name two applications for chromium.

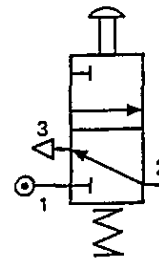
4.

(45 marks)

- (a) Explain the basic difference between fusion welding and bronze welding.
- (b) State two safety precautions to be observed when using electric arc welding equipment.
- (c) What is the function of flux coating on an electrode for electric arc welding?
- (d) Name the process for making a permanent joint in each of the following:
 - (i) Tinplate;
 - (ii) Mild steel plate;
 - (iii) Light gauge aluminium;
 - (iv) Perspex.

OR

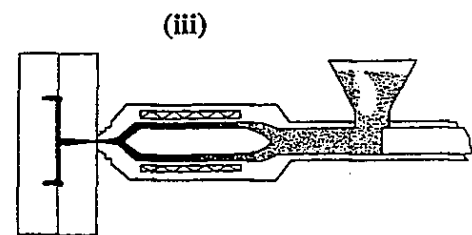
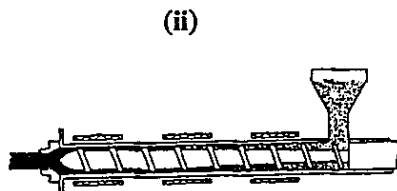
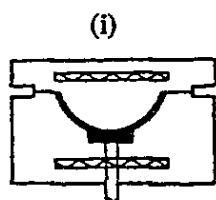
- (d) Name the pneumatic component shown and name parts 1, 2 and 3.



5.

(45 marks)

- (a) Name the three methods shown which are used in the manufacturing of plastics.

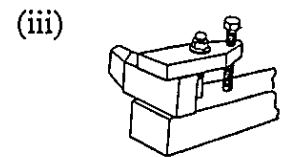
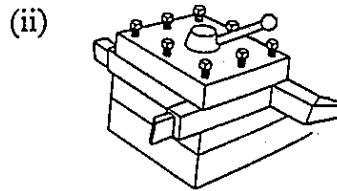
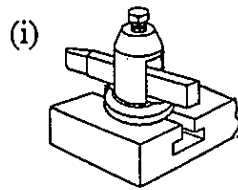


- (b) Explain one method and give an example of the type of component which can be produced.
- (c) Name the plastics material used to produce the following:
 - (i) A CD;
 - (ii) Gear Wheel;
 - (iii) Garden Hose.
- (d) Explain the essential difference between thermoplastic and thermosetting plastic.

6.

(45 marks)

- (a) Name the **three** lathe toolposts and give one advantage and one disadvantage for the use of each one in the workshop.



- (b) Name **two** methods of taper turning using the centre lathe and explain one method with the aid of diagram and note.
- (c) Name **three** safety precautions when operating the centre lathe.

OR

- (c) What are the main advantages of operating a lathe by Computer Numerical Control (CNC) over a manual controlled lathe?

7.

(45 marks)

- (a) Define the term *interference fit* as used in a system of limits and fits.
- (b) Explain the essential difference between a plug gauge and a gap gauge.
- (c) Holes and shafts of 50mm nominal diameter are machined so as to give a precision location fit when assembled. The following conditions are specified:

(i)	Minimum hole diameter	50.00mm
(ii)	Minimum shaft diameter	49.971mm
(iii)	Minimum clearance	0.010mm
(iv)	Maximum clearance	0.059mm

Determine the tolerance for the shaft and the hole.

OR

- (c) Describe the operation and function of **any one** of the following:

(i) Dial gauge; (ii) Double acting pneumatic cylinder; (iii) Solenoid.