



M72

**Coimisiún na Scrúduithe Stáit
State Examinations Commission**

LEAVING CERTIFICATE EXAMINATION, 2006

ENGINEERING - MATERIALS AND TECHNOLOGY

(Ordinary Level - 200 marks)

FRIDAY, 23 JUNE, MORNING 9.30 – 12.00

Answer Sections A and B of Question 1 and three other questions.

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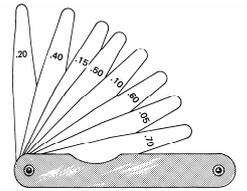
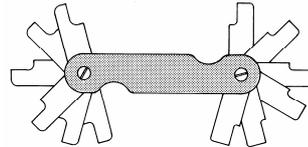
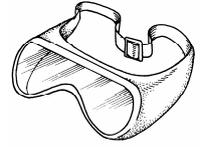
1.

(65 marks)

SECTION A - 30 marks

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

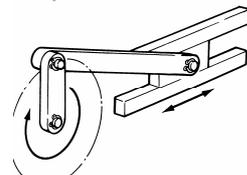
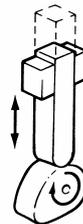
- (a) Identify **two** areas of work where it is essential to wear safety goggles.
- (b) State the purpose of **any one** of the following in electronic circuits:
 - (i) Printed circuit board (PCB), (ii) Light emitting diode (LED), (iii) Switch.
- (c) Name the alloy produced from the metals *lead* and *tin*.
- (d) State the purpose of an electrical insulator.
- (e) Give a typical application for the vacuum forming process.
- (f) For any **two** of the following thread forms, identify a suitable application:
 - (i) Square thread, (ii) Acme thread, (iii) Buttress thread.
- (g) Name **two** computer input devices.
- (h) Name **one** of the gauges shown.



SECTION B - 35 marks

Answer **any three** of the following:

- (i) Describe the function and operation of **any one** of the following:
Plastic dip coating tank, Morse taper sleeve, Vee blocks and clamp.
- (j) Explain **any two** of the computing terms:
Virus, Computer network, Hard disk, USB port.
- (k) Describe the difference between a compressive force and a tensile force.
- (l) Explain **any two** of the terms:
Fuse, Surface plate, Voltmeter, Pop rivet.
- (m) Name **one** of the mechanisms shown.



2.

(45 marks)

- (a) (i) Name a furnace used in the production of steel.
(ii) Make a sketch of this furnace and explain its operation.
- (b) State a suitable application for **any three** of the following metals:
(i) Stainless steel, (ii) Copper, (iii) Cast iron, (iv) Brass.
- (c) Describe **any two** of the following terms:
(i) Galvanised steel, (ii) Bright mild steel, (iii) Tinplate.
- (d) Name the ore from which **one** of the following is produced:
(i) Aluminium, (ii) Lead, (iii) Iron.

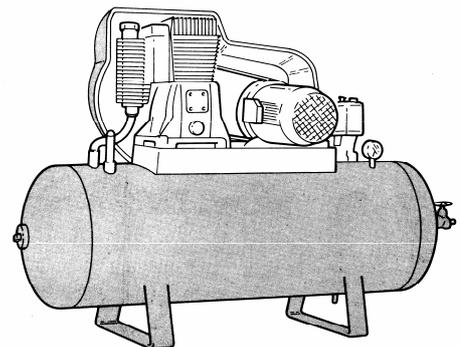
3.

(45 marks)

- (a) Explain the condition of high carbon steel when:
(i) Cooled **quickly** from a temperature of 900°C;
(ii) Allowed to cool **slowly** from a temperature of 900°C.
- (b) Explain **any two** of the following terms in relation to the properties of metals:
(i) Toughness, (ii) Malleability, (iii) Elasticity.
- (c) What does *case hardening* mean?
- (d) Identify **two** safety precautions required when working with hot metals.

OR

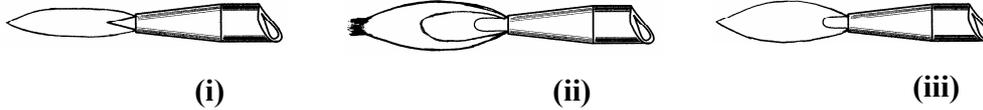
- (d) Give **two** applications for the pneumatic compressor shown.



4.

(45 marks)

(a) Identify the **three** types of oxy-acetylene flame shown:



(b) (i) Describe the basic **differences** between soft soldering and manual metal arc welding.

(ii) Suggest **one** suitable application for each process.

(c) (i) State the purpose of a flux when soldering.

(ii) When soldering electrical circuits, which of the fluxes, *active* or *passive*, is used?

(iii) Give a reason for your answer in (ii).

(d) State **two** health hazards associated with welding procedures.

5.

(45 marks)

(a) Describe **one** of the following processes used in the manufacture of plastic components and identify the component produced.

(i) Injection moulding, (ii) Compression moulding, (iii) Blow moulding.

(b) Identify the types of plastic which:

(i) Softens when heated;

(ii) Remains hard when heated.

(c) Identify **two** safety precautions to be observed when drilling acrylic sheet.

(d) Name the plastics used in the manufacture of:

(i) Fishing line, (ii) Bin liners.

6.

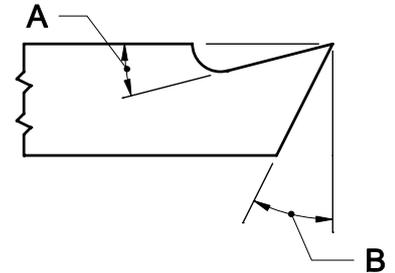
(45 marks)

(a) Describe a suitable application for **any three** of the following lathe parts:

(i) Faceplate, (ii) Three jaw chuck, (iii) Knurling tool, (iv) Four jaw independent chuck.

(b) (i) Name the tool angles indicated on the lathe cutting tool shown.

(ii) State the purpose of **one** of the tool angles indicated.



(c) Describe, using sketches, **any two** of the following turning operations:

(i) Parallel turning, (ii) Taper turning, (iii) Facing.

OR

(c) Identify **two** safety precautions to be taken when machining on a CNC lathe.

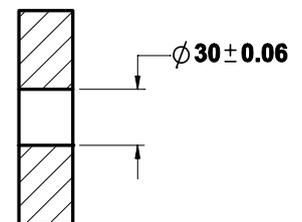
7.

(45 marks)

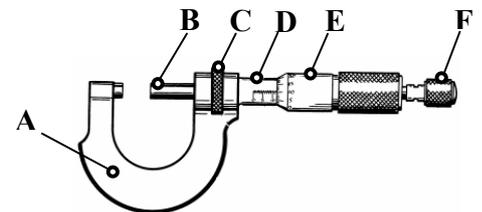
(a) Name **any two** types of fit in the assembly of a shaft and hole.

(b) A hole is produced in a steel plate to the dimensions shown.

State the (i) Nominal diameter of the hole;
(ii) Maximum diameter of the hole;
(iii) Minimum diameter of the hole;
(iv) Tolerance of the hole.

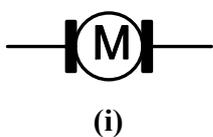


(c) Name the measuring instrument shown and identify **any two** of the parts indicated.

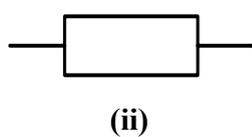


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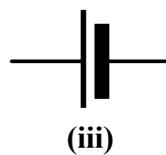
(c) Identify **any three** of the electronic symbols shown:



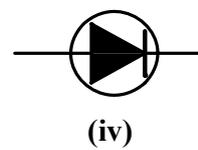
(i)



(ii)



(iii)



(iv)

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