



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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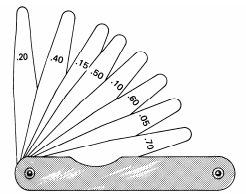
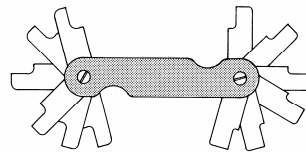
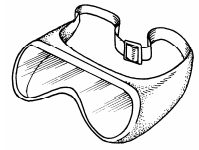
1.

(65 marks)

SECTION A - 30 marks

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

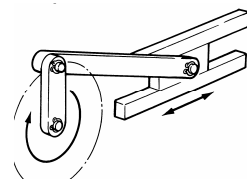
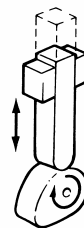
- (a) Identify **two** areas of work where it is essential to wear safety goggles.
- (b) State the purpose of **any one** of the following in electronic circuits:
 - (i) Printed circuit board (PCB), (ii) Light emitting diode (LED), (iii) Switch.
- (c) Name the alloy produced from the metals *lead* and *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.

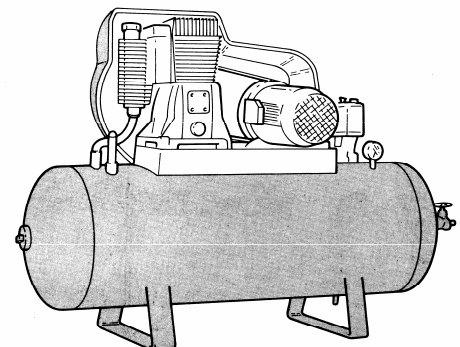
3.

(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

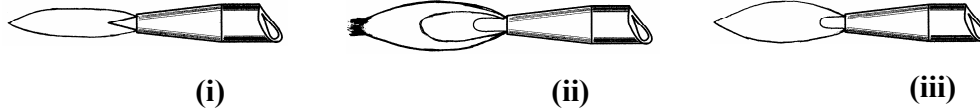
- (d) Give **two** applications for the pneumatic compressor shown.



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.

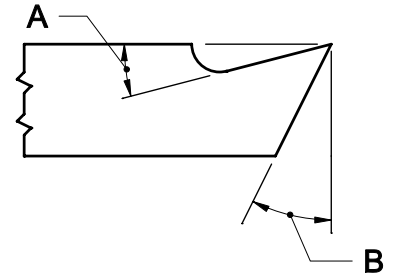
(45 marks)

(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.

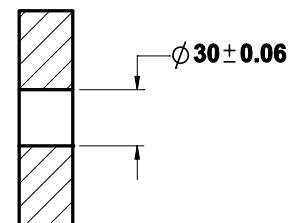
(45 marks)

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

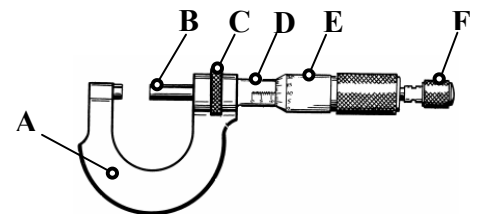
(b) A hole is produced in a steel plate to the dimensions shown.

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.

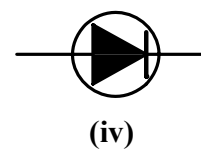
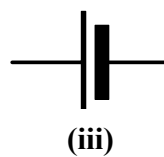
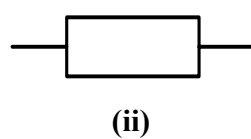
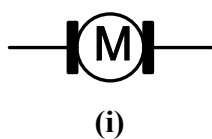


(c) Name the measuring instrument shown and identify **any two** of the parts indicated.



OR

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



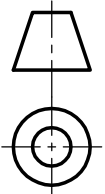
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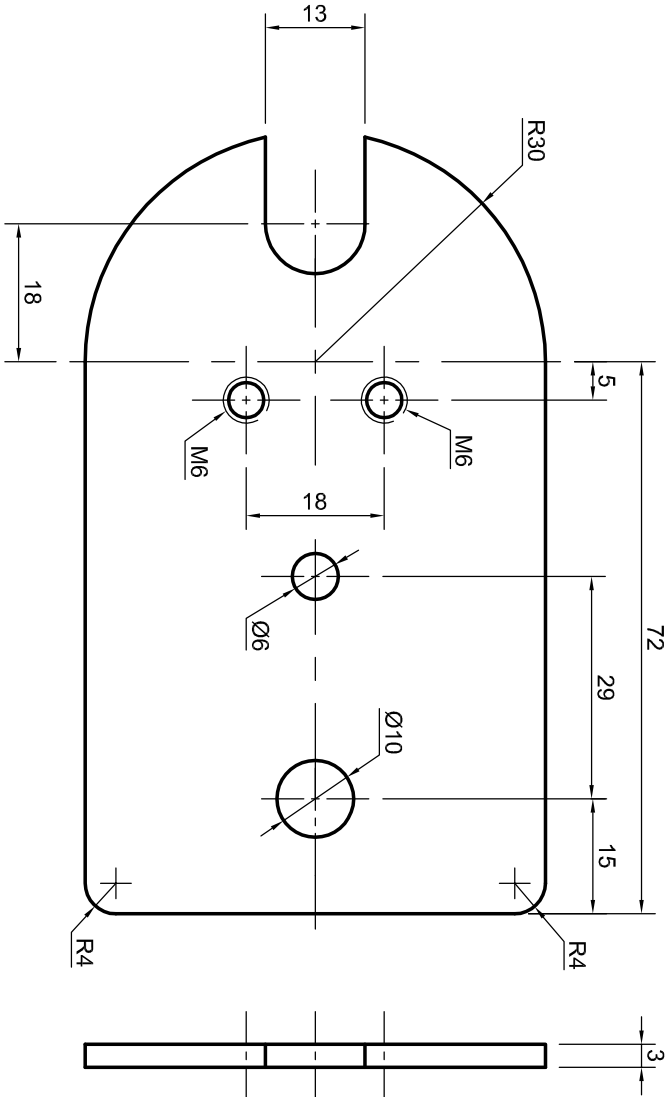
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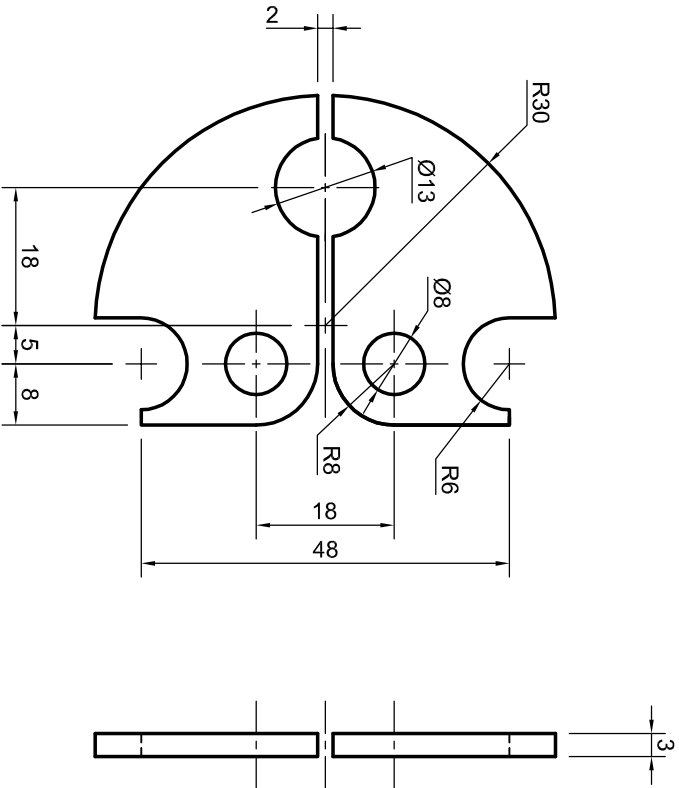
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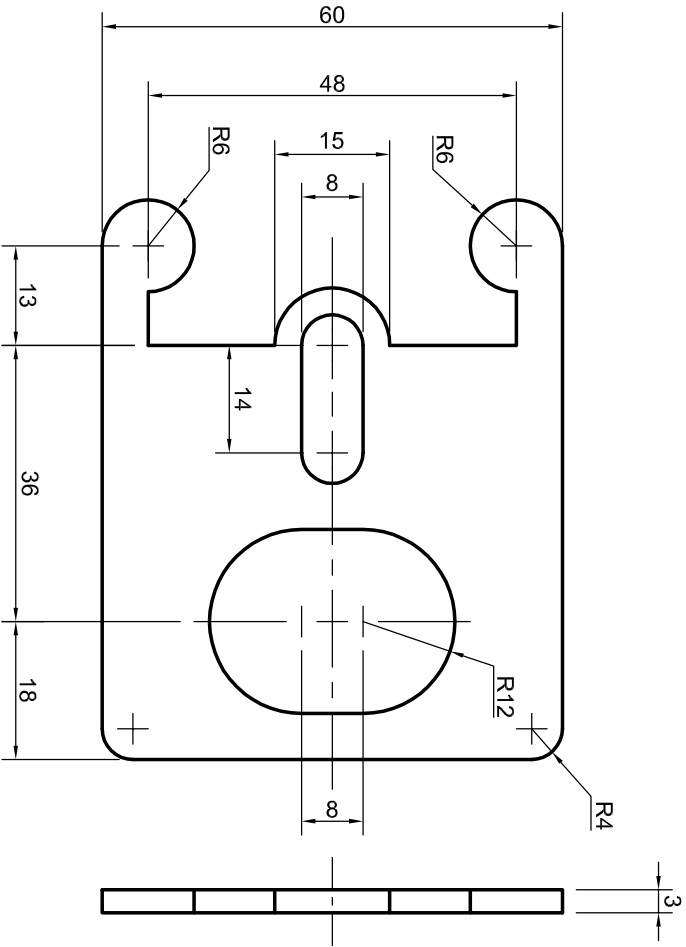
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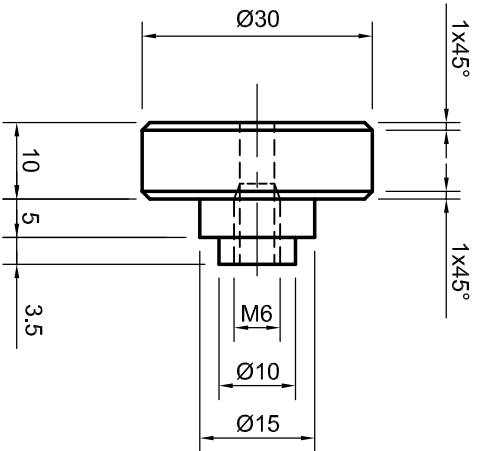
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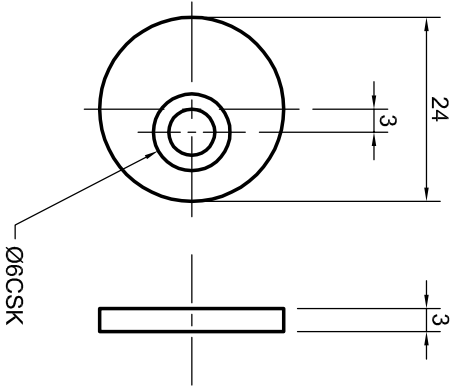
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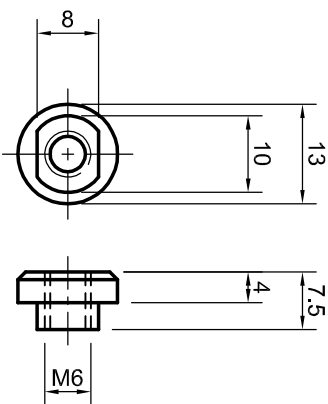
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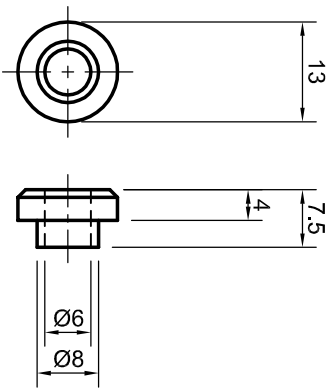


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