



2007. M72

Coimisiún na Scrúduithe Stáit
State Examinations Commission

LEAVING CERTIFICATE EXAMINATION, 2007

ENGINEERING - MATERIALS AND TECHNOLOGY

(Ordinary Level - 200 marks)

FRIDAY, 22 JUNE, MORNING 9.30 – 12.00

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

1.

(65 marks)

SECTION A - 30 marks

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

(a) State **two** safety precautions to be observed when using a pillar-drilling machine.

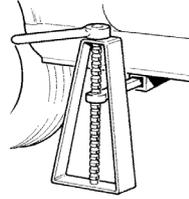
(b) Name the electronic component represented by the symbol shown.



(c) Explain the term self-locking nut.



(d) State the purpose of an *alloy*.

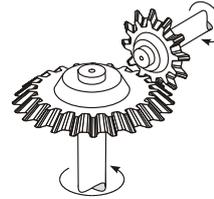


(e) Explain the term *temporary joint*.

(f) Name a thread form suitable for the car jack shown.

(g) Name **one** computer hardware device and state whether it is an input or an output device.

(h) Identify the gear system shown and state a suitable use.



SECTION B - 35 marks

Answer **any three** of the following:

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

Surface Plate,

Tailstock,

Strip Heater.

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

Software,

Memory stick,

CDRW,

Computer simulation.

(k) Define conductivity in relation to the properties of metals and give **one** example of a good conductor.

(l) Explain **any two** of the terms:

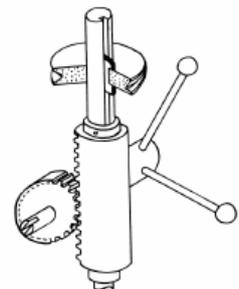
Chuck guard,

Engraving,

Depth gauge,

Hand vice.

(m) Identify the mechanism shown and describe its operation.

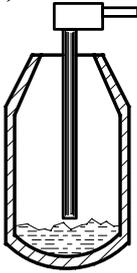


2.

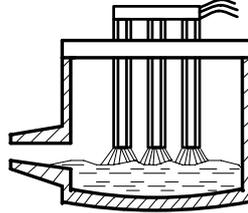
(45 marks)

(a) Name **any two** of the furnaces shown and identify the metal produced in each:

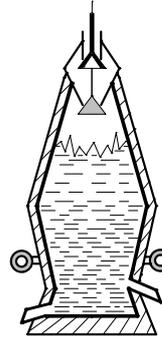
(i)



(ii)



(iii)



(b) Identify the materials used to manufacture **any three** of the following:

(i) Soft drink cans, (ii) Hand files, (iii) Electrical wire, (iv) Roof flashings.

(c) Name the metals used to produce **any two** of the following alloys:

(i) Brass, (ii) Soft solder, (iii) Bronze.

(d) Explain the term *non-ferrous* metal.

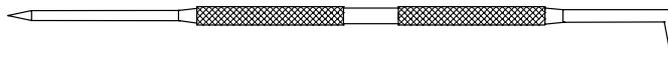
3.

(45 marks)

(a) Explain **any one** of the following heat treatment processes:

(i) Annealing, (ii) Case hardening.

(b) Describe how the point of the scriber shown is hardened and tempered.



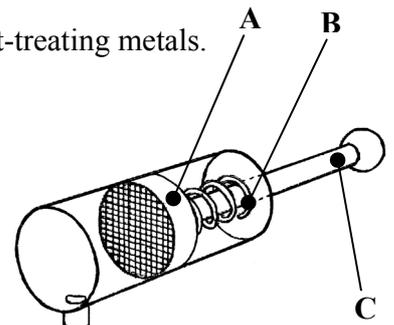
(c) Explain **any two** of the following metal properties:

(i) Brittleness, (ii) Ductility, (iii) Malleability.

(d) Identify **any two** items of protective clothing to be worn when heat-treating metals.

OR

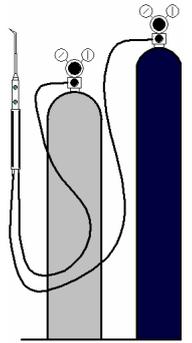
(d) Name **any two** of the parts A, B and C shown on the pneumatic cylinder.



4.

(45 marks)

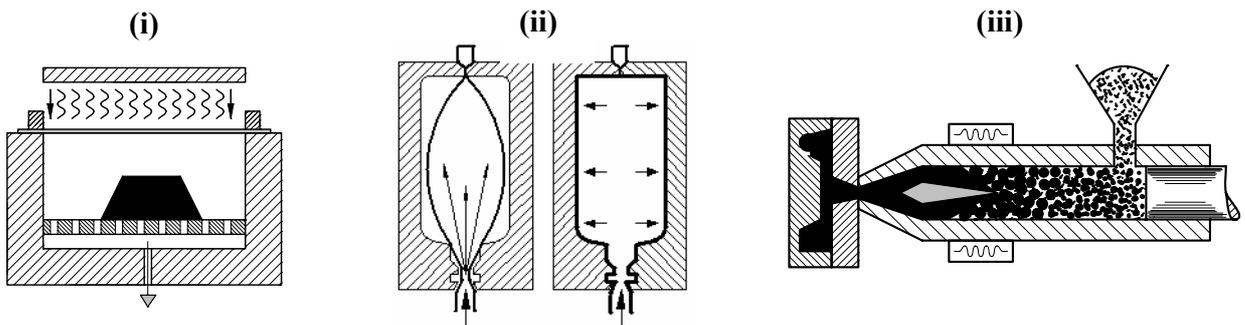
- (a) (i) Name the **two** gases most commonly used when gas welding.
- (ii) Describe, with the aid of a suitable diagram, **any one** of the flames produced when gas welding.
- (b) Explain **any three** of the following in relation to welding:
- (i) Oxides, (ii) Flashback arrestor, (iii) Pressure gauge, (iv) Welding torch.
- (c) Identify a suitable method used to make a permanent joint in **each** of the following materials:
- (i) Heavy gauge mild steel plate;
- (ii) Acrylic sheet;
- (iii) Light gauge copper sheet.
- (d) List **two** safety precautions to be observed when soldering electrical components.



5.

(45 marks)

- (a) Name the **three** plastic manufacturing processes shown below:

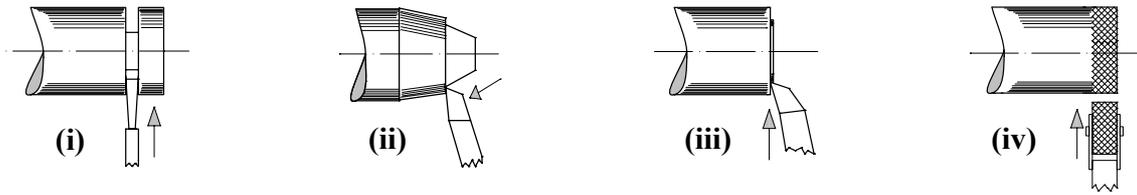


- (b) Describe **one** of the plastic manufacturing processes shown in (a) and identify **one** component produced.
- (c) Explain **any two** of the following terms used in plastics technology:
- (i) Thermosetting plastic, (ii) Laminating, (iii) Thermoplastic.
- (d) List **two** safety precautions to be observed when using a plastic dip coating tank.

6.

(45 marks)

(a) Name **any three** of the lathe turning operations shown below:



(b) Describe **any three** of the following terms associated with drilling:

(i) Pilot hole, (ii) Countersink hole, (iii) Clearance hole, (iv) Blind hole.

(c) Sketch a lathe cutting tool showing **any two** of the following angles:

(i) Top rake, (ii) Front clearance, (iii) Side clearance.

OR

(c) Explain **any two** of the following engineering technology terms:

(i) CAM, (ii) CNC, (iii) CAD.

7.

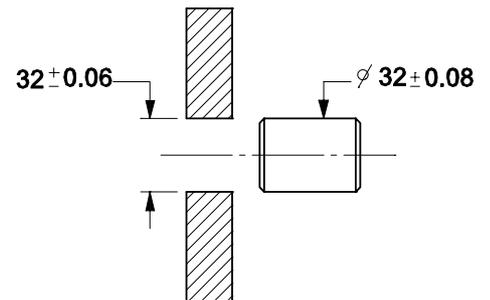
(45 marks)

(a) In relation to limits and fits, explain **any two** of the following:

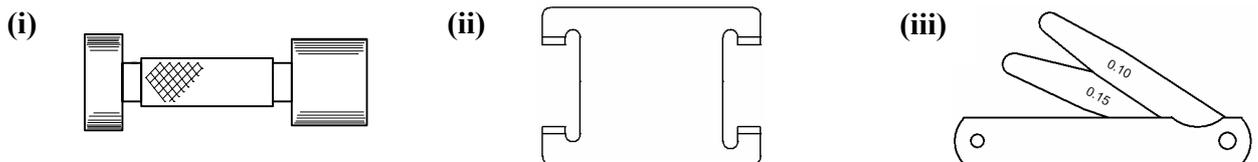
(i) Interference fit, (ii) Clearance fit, (iii) Tolerance.

(b) A hole and shaft are produced to the dimensions shown.

- State the:
- (i) nominal diameter of the hole;
 - (ii) nominal diameter of the shaft;
 - (iii) lower limit of the hole;
 - (iv) higher limit of the shaft.

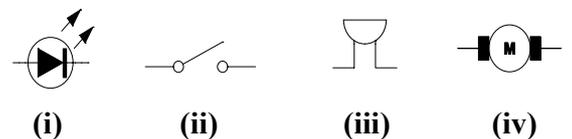


(c) Name and give an application for **any two** of the gauges shown below:



OR

(c) Name **any three** of the electrical symbols shown:



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