

**AN ROINN OIDEACHAIS**

**M.84**

**LEAVING CERTIFICATE EXAMINATION, 1992**

5674

TECHNICAL DRAWING - HIGHER LEVEL

PAPER II (A) - ENGINEERING APPLICATIONS

MONDAY, 22 JUNE - MORNING 9.30 to 12.30

200 Marks

**INSTRUCTIONS**



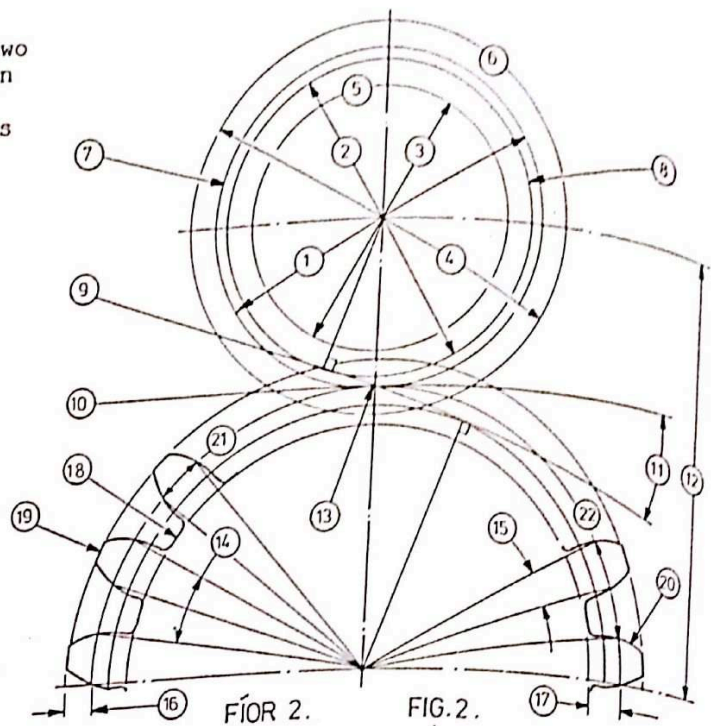
- (a) Answer four questions.
- (b) All questions carry equal marks.
- (c) Drawings and sketches should be in pencil unless otherwise stated.
- (d) Where dimensions are omitted they may be estimated.
- (e) Credit will be given for neat orderly presentation of work.
- (f) Candidates should work on one side of the paper only.
- (g) The Examination Number should be written on each drawing sheet used.
- (h) All dimensions are in millimetres.

1. Details of a BENCH ROLLS are given in Fig. 1 with the parts list tabulated below.
- (a) Draw a full size sectional elevation A-A showing the parts completely assembled.
  - (b) Insert item reference numbers to identify the parts and add the title BENCH ROLLS.
  - (c) A handle is required to operate the bench rolls by turning the bottom roller. Draw a neat freehand sketch of a handle suitable for this purpose.

INDEX	PART	REQUIRED
1	Frame	1
2	Top Roller	1
3	Bottom Roller	1
4	Bottom Bearing Block	2
5	Top Bearing Block	2
6	Adjusting Screw	2
7	Dowel	2

OVER ->

2. (a) A schematic diagram of two gears in mesh is shown in Fig. 2. List any 16 of the 22 balloon references shown in the diagram, giving reference number and name.
- (b) Draw a rack and pinion in mesh. The drawing should include three teeth on the rack, one tooth on the pinion and all relevant calculations. Pinion data: 12 teeth, pressure angle  $20^\circ$ , module 16 mm.
- (c) Show how motion can be transmitted through an angle of  $90^\circ$  with a gear ratio of 2:1. A line diagram to show the pitch cones will suffice. Name the gearing used for this type of transmission.



3. Two views of a chute assembly are shown in Fig.3. The assembly consists of a transition piece A and two intersecting cones. The cones are cut and are identical.

- (a) Draw the given views. Hidden detail need not be shown.
- (b) Draw the complete development of one of the conical parts.
- (c) Draw a half development of the transition piece A.

On both developments, choose the shortest seam possible.

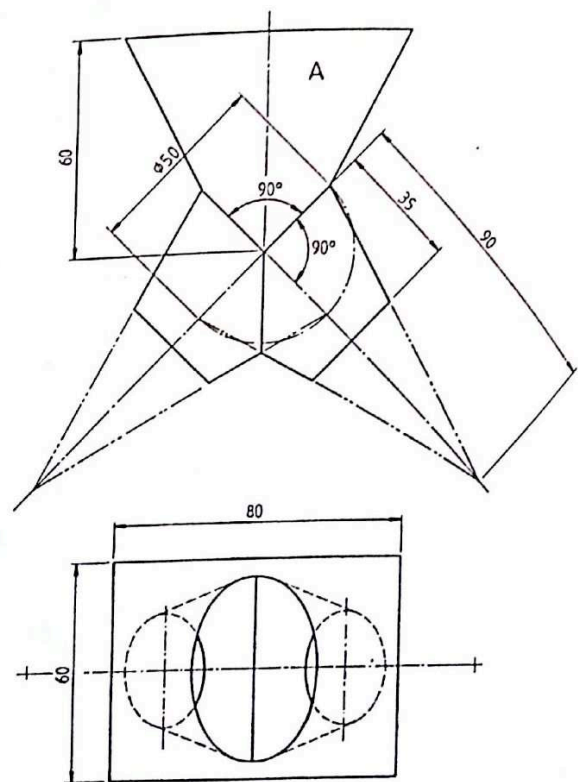


FIG. 3.

FIG. 3.

4. The sectional elevation of a plunger pump is shown in Fig. 4. The drawing shows the pump with the plunger completing the delivery stroke.

(a) (i) Make a neat freehand sketch of the pump to show the plunger on the inlet stroke.

(ii) Identify and neatly label on the sketch the following parts:  
Cam, Camshaft, Compression spring, Delivery port, Body, Plunger,  
Delivery valve, Inlet valve, Stop pins (2), Inlet port.

(iii) Title the sketch and show the flow direction through the pump.

(b) Draw, twice full size, the cam displacement diagram for the inlet stroke.  
Cam diameter 35 mm, shaft diameter 20 mm.

5. The plan and elevation of a valve casting are shown in Fig. 5.

(a) Draw the given elevation.

(b) Draw an auxiliary sectional plan A-A.

(c) Insert six leading dimensions on the sectional plan and add the title  
VALVE CASTING.

6. Answer SECTION A OR SECTION B but not both.

SECTION A

- (a) Using standard drawing conventions, draw an M20 stud and blind hole assembly. Stud length 100 mm, thread lengths 30 mm and 40 mm. Hole with 45 mm minimum length of full thread. Dimension the drawing.
- (b) Construct two complete coils of a left hand helical compression spring, 10 mm square section, with a pitch of 50 mm and a mean diameter of 100mm.

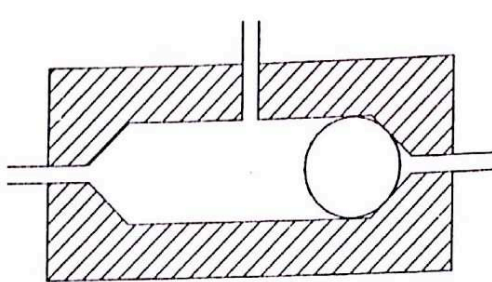
OR

SECTION B

- (a) Describe a typical CAD system. Use a block diagram.
- (b) Complete the following table on your drawing sheet. The first answer has been entered for guidance.

ITEM	DEVICE		FUNCTION
	INPUT	OUTPUT	
VDU		✓	To visually display information and drawings
MOUSE			
DISK DRIVE			
PLOTTER			
KEYBOARD			
PUCK			

- (c) Use a sketch to explain 3D Wire Frame modelling. Explain why this is the lowest level of modelling.
- (d) Complete the following table on your drawing sheet. The first answer has been entered for guidance.



Shuttle Valve

Drawing commands used:

1. Line
2. \_\_\_\_\_
3. \_\_\_\_\_
4. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_



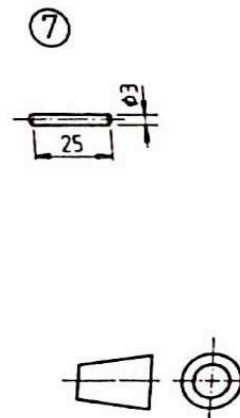
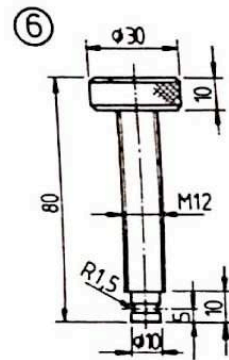
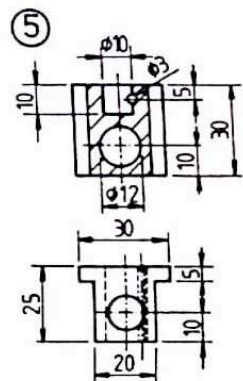
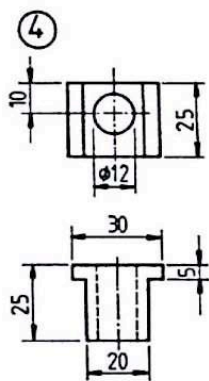
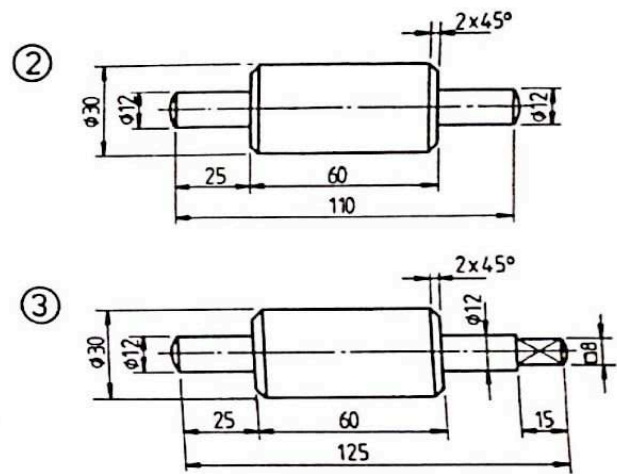
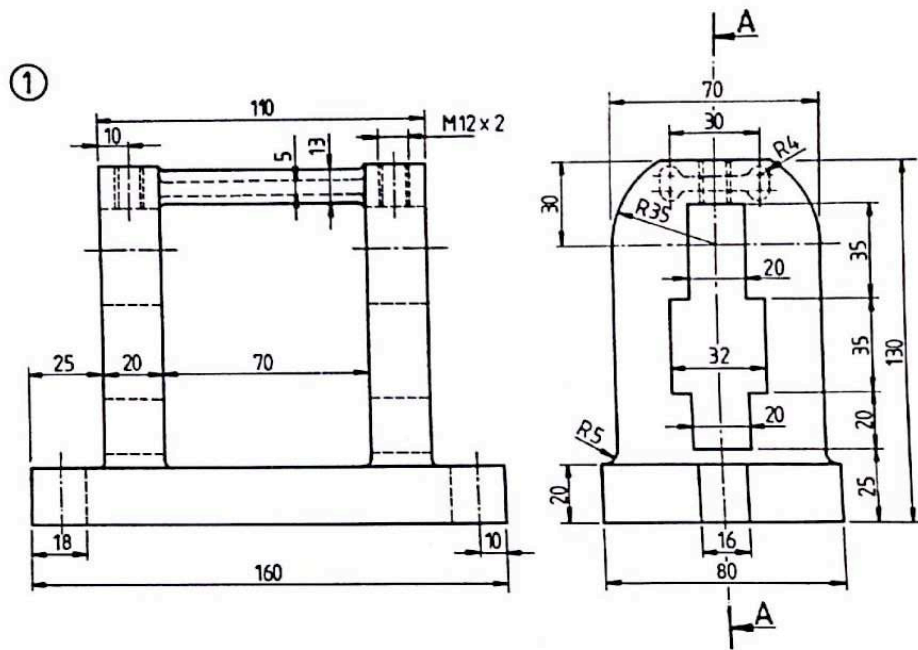
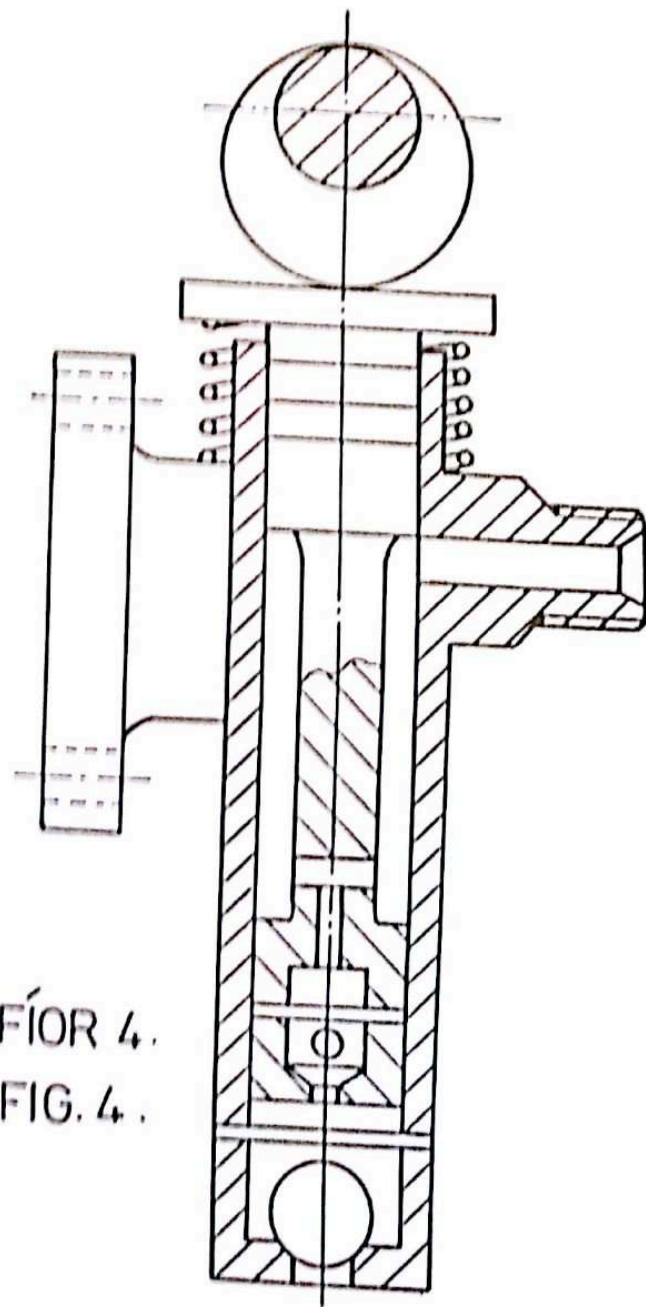


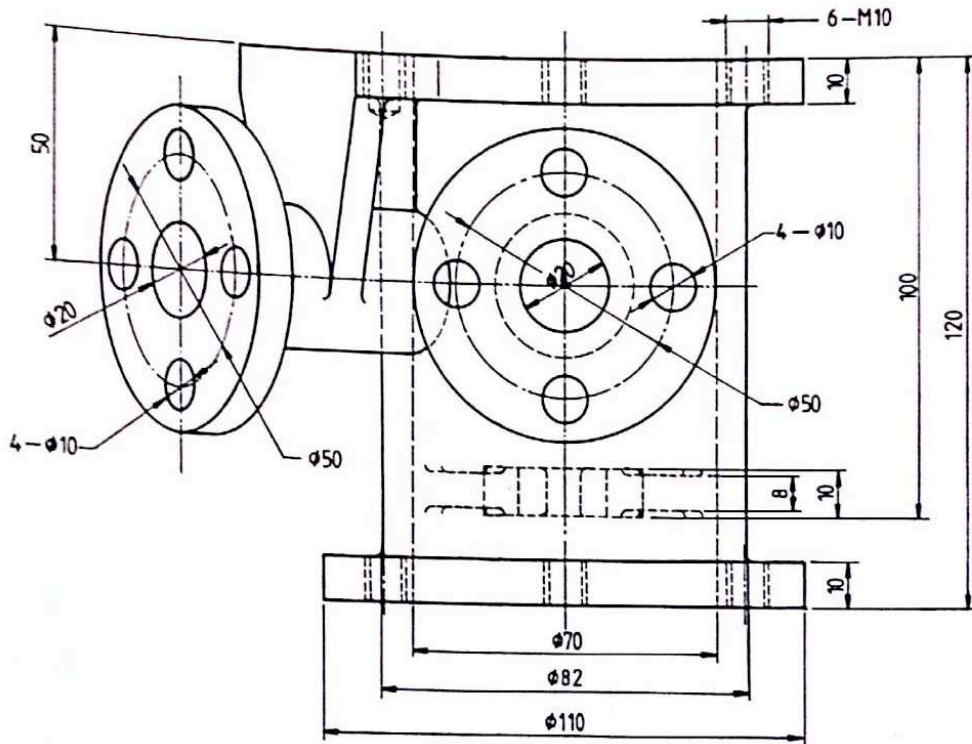
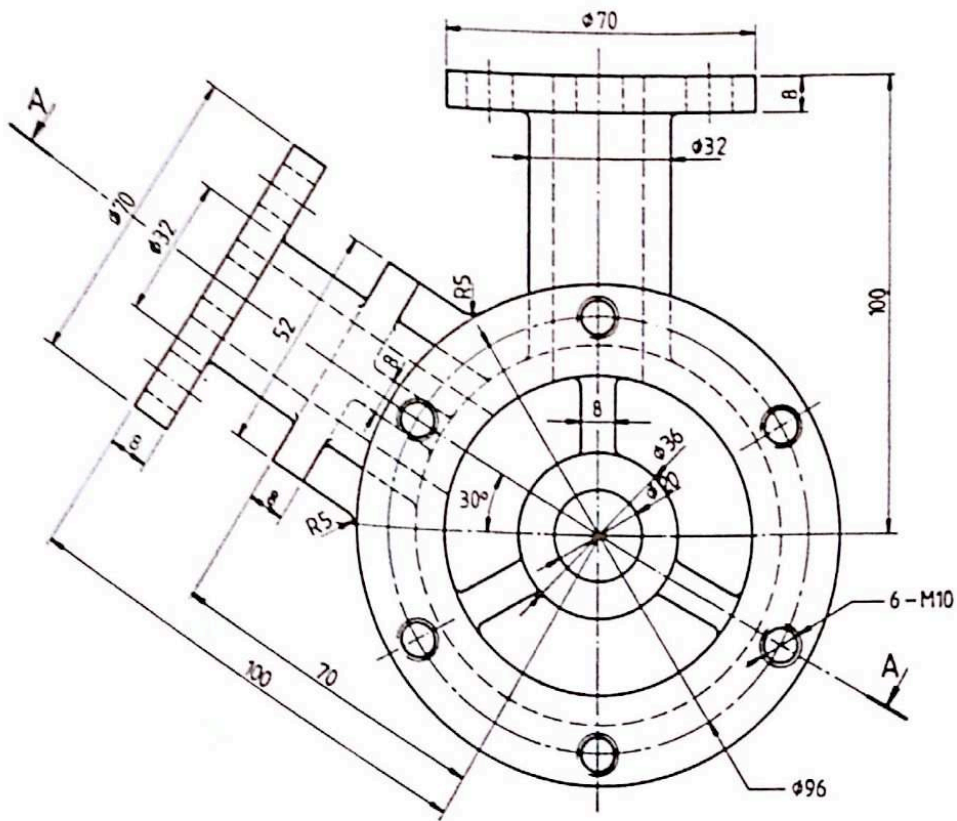
FIG. 1.

FIG. 1.



FÍOR 4.  
FIG. 4.

THALL  
OVER



FÍOR 5.

FIG. 5.

