

## LEAVING CERTIFICATE EXAMINATION, 1978

TECHNICAL DRAWING - COMMON LEVEL - PAPER I  
(Plane and Solid Geometry)

WEDNESDAY, 14 JUNE - AFTERNOON 2 to 4.30

## INSTRUCTIONS

- (a) Answer four questions.  
 (b) All questions carry equal marks.  
 (c) Construction lines must be shown on all solutions.  
 (d) Write the number of the question distinctly on the answer paper.  
 (e) All dimensions on the question paper are given in millimetres.  
 (f) First or third angle projection may be used.

1. Fig. 1 shows the elevation of a cut pyramid which has an equilateral triangular base.  
 (a) Draw the elevation and plan of the cut pyramid.  
 (b) Draw another plan which will show the true shape of the cut surface A. Scale 1 : 1.
2. (a) The focus of an ellipse is 30 mm from the directrix and the eccentricity is 0.8. Construct this ellipse.  
 (b) Draw the triangle ABC shown in fig. 2. The line AC in this triangle is the directrix of an ellipse having an eccentricity of 0.75. The points B and D are on the curve. Construct this ellipse given that both foci lie outside the triangle ABC. Scale 1 : 1.
3. Fig. 3 shows the elevation and plan of a solid which is cut by the oblique plane VTH.  
 (a) Draw the elevation and plan of the cut solid.  
 (b) Determine the true angle between the oblique plane VTH and the vertical plane. Scale 1 : 1.
4. (a) Construct the involute to a circle of diameter 40 mm.  
 (b) Fig. 4 shows the outline of a piece of metal in which the curves from A to B are involutes to the circle of radius 120 mm. Draw this outline to the dimensions given. Scale 1 : 1.
5. Fig. 5 shows the elevation of a cylinder and the outline of a paper label. When the label is wrapped around the cylinder the curve at A meets the centre-line of the cylinder in elevation and the curve at B meets the curve at A tangentially.  
 (a) Draw the outline of the label.  
 (b) Draw the elevation of the cylinder showing the wrapped label in position. Scale 1 : 1.
6. Fig. 6 shows the plan of a rectangular pyramid resting on the horizontal plane and which is penetrated by a hexagonal prism. The pyramid is 80 mm high and the prism is 100 mm high.  
 (a) Draw the plan and elevation of the solids showing all lines of interpenetration.  
 (b) Draw the true shape of the surface A of the pyramid. Scale 1 : 1.
7. (a) A plate cam rotating in a clockwise direction gives a knife-edge follower the following motion:
- |             |   |
|-------------|---|
| 0° - 150°   | lift 40 mm with simple harmonic motion. |
| 150° - 210° | dwell.                                  |
| 210° - 270° | fall 16 mm with uniform velocity.       |
| 270° - 360° | fall 24 mm with simple harmonic motion. |
- The nearest approach of the follower to the cam centre is 30 mm.  
 The cam shaft diameter is 20 mm.  
 Draw the profile of the cam.
- (b) If the motion for the period 0° - 150° in the example above is changed to uniform acceleration and retardation with the lift remaining the same, draw the cam graph (displacement diagram) for this period. Scale 1 : 1.



