

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

FRIDAY, 17 JUNE - AFTERNOON 2.00 - 5.00

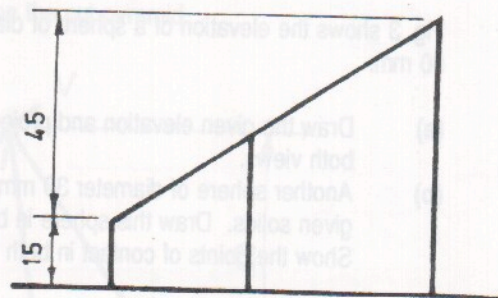
200 marks

**INSTRUCTIONS**

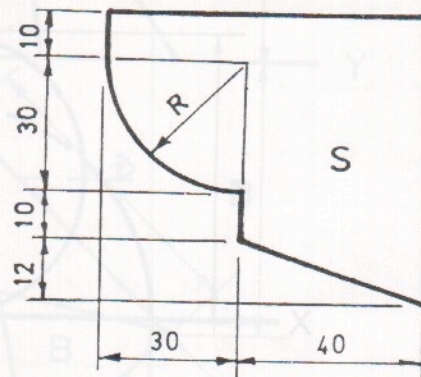
- (a) Answer four questions.
- (b) All questions carry equal marks.
- (c) Construction lines must be shown on all solutions.
- (d) Write the number of the question distinctly on the answer paper.
- (e) All dimensions on the question paper are given in millimetres.
- (f) First or third angle projection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

1. The elevation and plan of a shaped solid are shown in Fig. 1.

- (a) Draw the given views and project an end view of the solid.



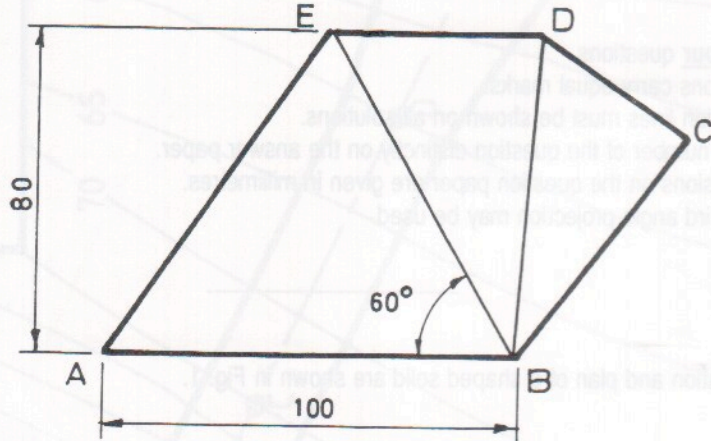
- (b) Project a new plan of the solid which shall include the true shape of the surface S.



**Fig. 1**

2. In the irregular pentagon ABCDE shown in Fig. 2, the triangle BDE is half the area of the triangle ABE. The triangles BDE and BCD are similar.

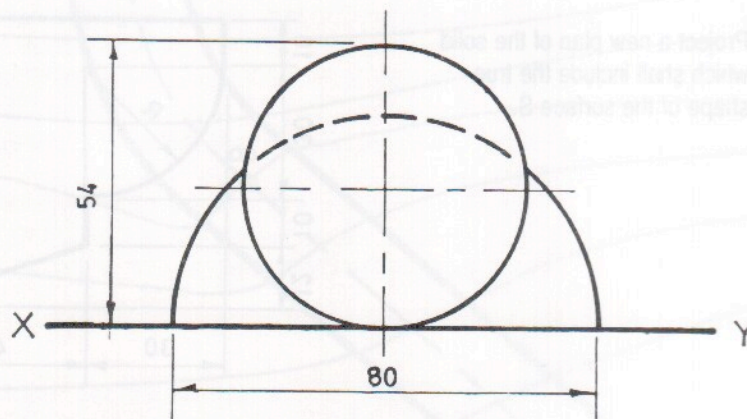
- Draw the pentagon ABCDE.
- From E draw a line which shall divide the area of the pentagon ABCDE into two equal areas.
- Draw a square which shall have an area 1.25 times that of the pentagon ABCDE.



**Fig. 2**

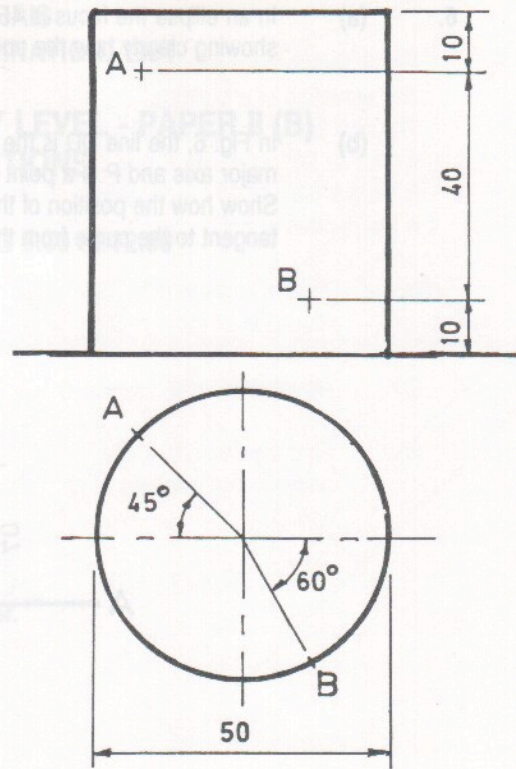
3. Fig. 3 shows the elevation of a sphere of diameter 54 mm in contact with a hemisphere of diameter 80 mm.

- Draw the given elevation and project a plan of the two solids showing the point of contact in both views.
- Another sphere of diameter 30 mm rests on the horizontal plane and is in contact with the given solids. Draw this sphere in both views showing clearly how the centre is located. Show the points of contact in both views.



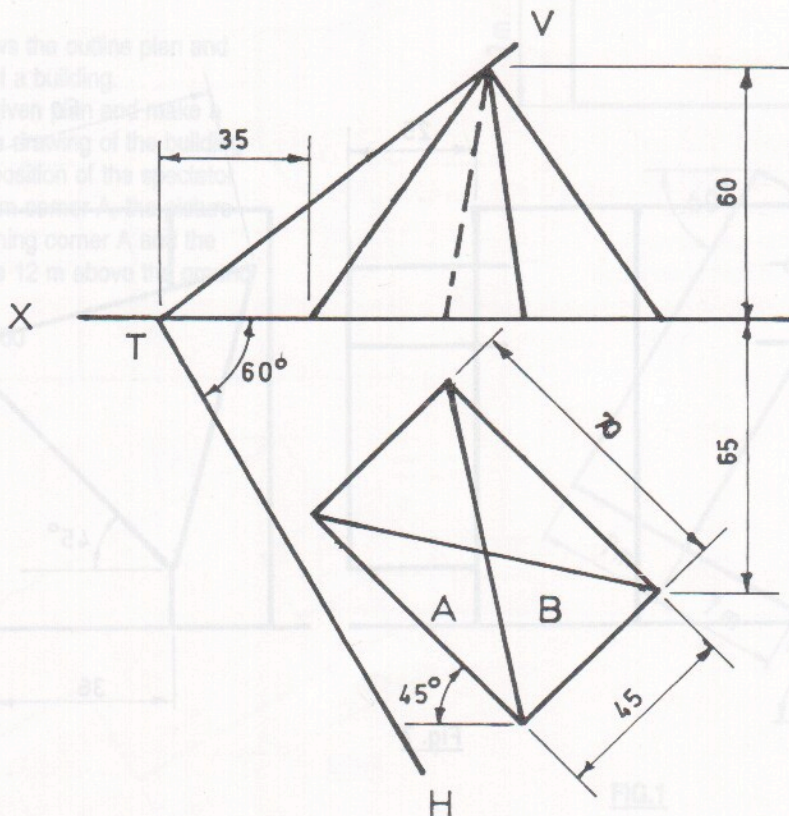
**Fig. 3**

4. (a) Draw one convolution of an Archimedian spiral where the shortest radius is 25 mm and the longest radius is 75 mm.
- (b) The elevation and plan of a cylinder with two points, A and B, on its surface are shown in Fig. 4. Show the path of a helix on the elevation of the cylinder which passes through the points A and B and which reaches the top and bottom of the cylinder.



**Fig. 4**

5. The elevation and plan of a rectangular pyramid which is to be cut by the oblique plane VTH are shown in Fig. 5.
- (a) Draw the plan and elevation of the pyramid when it is cut by the oblique plane VTH.
- (b) Find the true shape of the surfaces A and B on the cut pyramid.



**Fig. 5**

6. (a) In an ellipse the focus is 45 mm from the directrix and the eccentricity is  $\frac{3}{4}$ . Draw the ellipse showing clearly how the points on the curve are located.
- (b) In Fig. 6, the line DD is the directrix of an ellipse, the line AB shows the direction of the major axis and P is a point on the curve. The eccentricity of the ellipse is  $\frac{3}{4}$ . Show how the position of the focus F is determined and draw half the curve. Construct a tangent to the curve from the point Q.

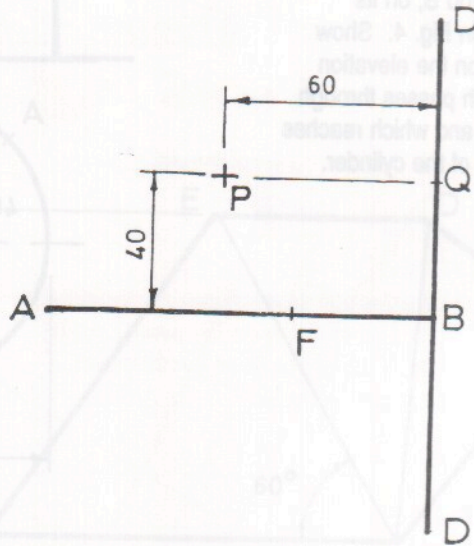


Fig. 6

7. Fig. 7 shows the incomplete elevation and the end view of a regular hexagonal prism of side 36 mm and an equilateral triangular prism of side 60 mm which intersect each other. Draw the plan, elevation and end view of the solids showing all lines of interpenetration.

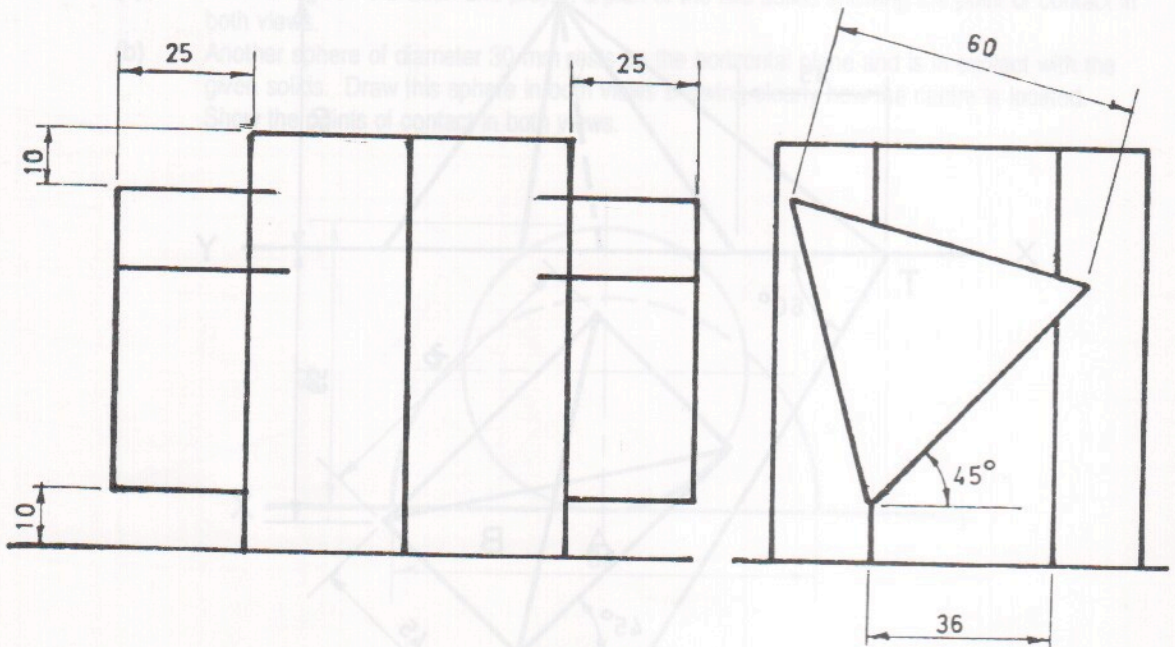


Fig. 7