

**TECHNICAL DRAWING - HIGHER LEVEL  
PAPER II(B) - BUILDING APPLICATIONS**

TUESDAY, 24 JUNE - AFTERNOON 2.00 P.M. TO 5.00 P.M.

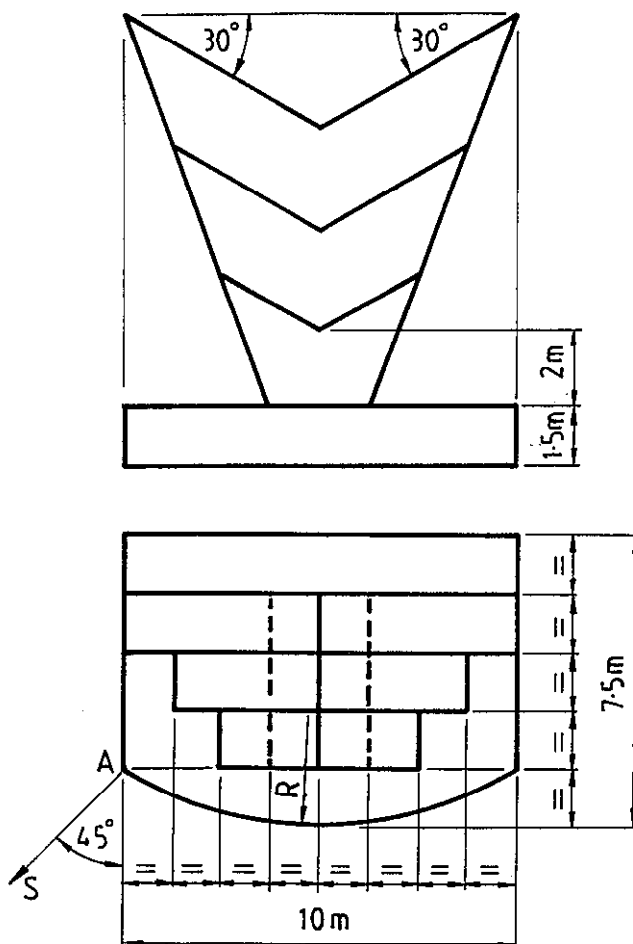
(200 Marks)

**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) First or third angle projection may be used.
- (f) All measurements are given in metres.

1. Draw a perspective view of the structure shown in Fig. 1. The picture plane passes through the corner A, the spectator S is 10 m from the corner A and the horizon line is 9 m above the ground line. Use auxiliary vanishing points where appropriate.

Scale 1 : 100

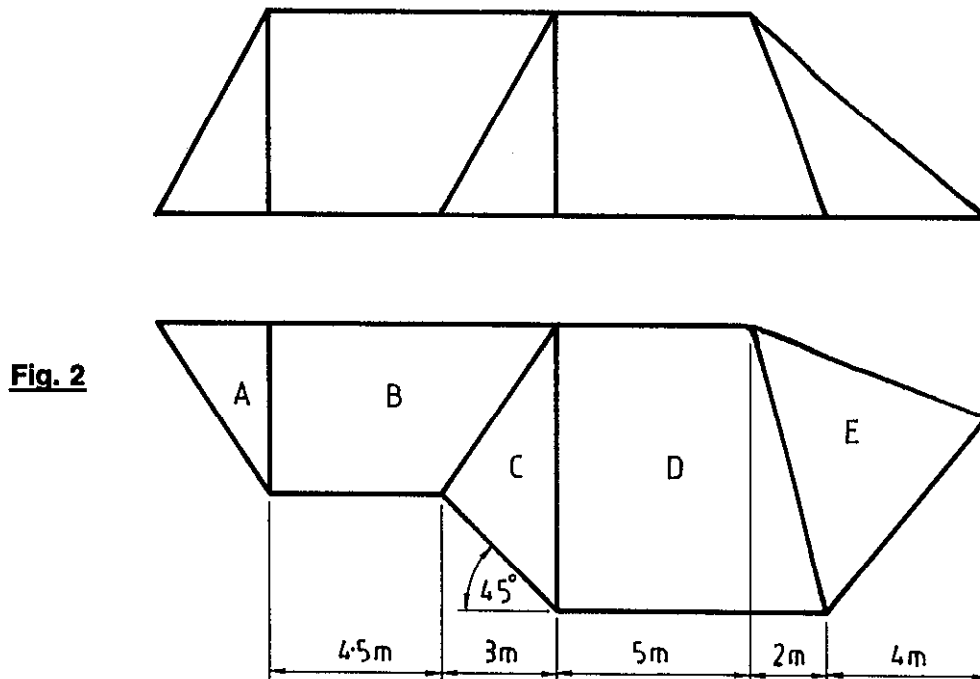


**Fig. 1**

2. Fig. 2 shows the outline plan and elevation of a roof. Surface B has a pitch of  $50^\circ$ , surface C has a pitch of  $45^\circ$  and surface E has a pitch of  $40^\circ$ . The dihedral angle between the surfaces A and B is  $130^\circ$ .

Draw the given plan and elevation and determine the dihedral angle between the surfaces D and E.

Scale 1 : 100

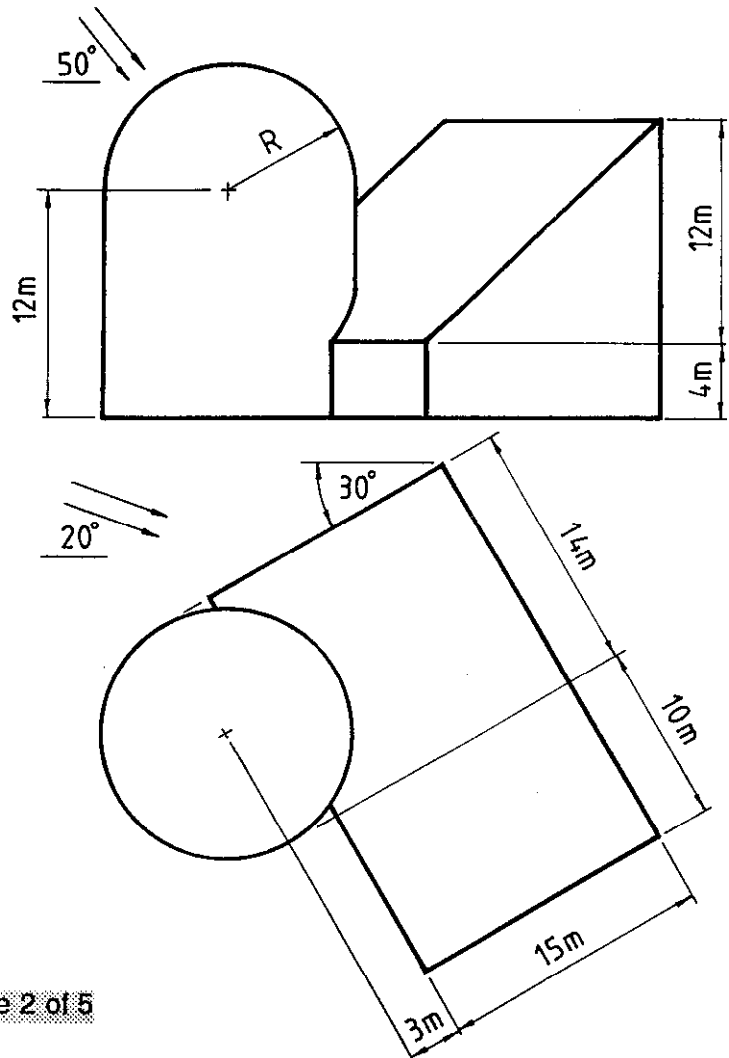


3. Fig. 3 shows the outline plan and elevation of a building.

Draw the given views and determine the shadows and shade in plan and elevation when the direction of the light is as shown in the figure.

Scale 1 : 200

**Fig. 3**



4. Fig. 4 shows the outline plan and elevation of a building. It is in the form of a hyperboloid of revolution. The outline of an entrance which projects from the main building is also shown.

Draw the plan and elevation of the building.

Scale 1 : 200

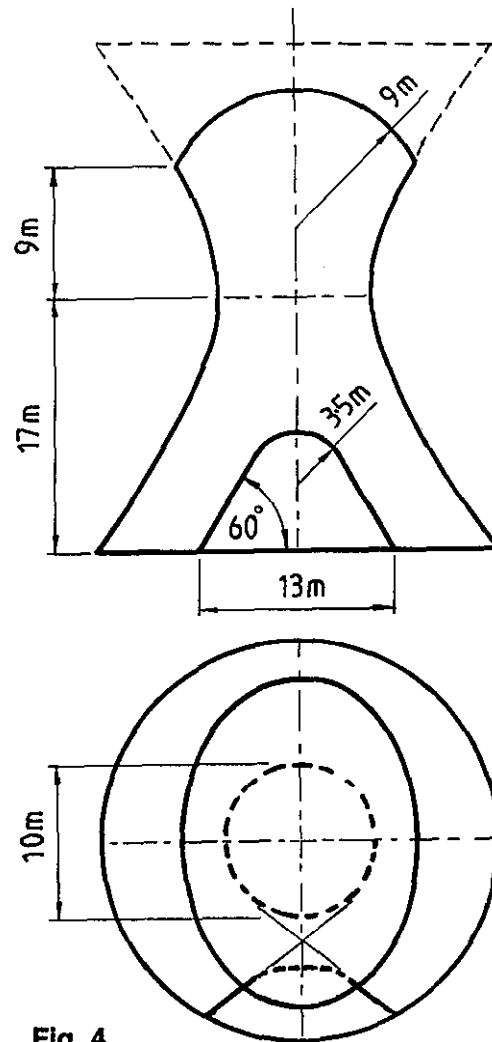


Fig. 4

5. On a contour map A and B are two points whose altitudes are 125 m and 130 m, respectively. On the map B is located 125 m east of A. A skew bore-hole at A is drilled in a north-easterly direction in plan and has an actual inclination of  $65^\circ$  to the horizontal plane. It reveals the top and bottom surfaces of a stratum at altitudes of 105 m and 40 m, respectively.

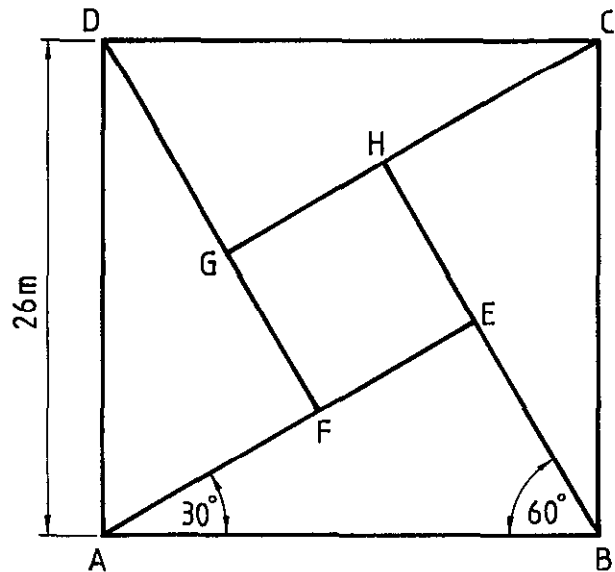
A skew bore-hole at B is drilled in a south-westerly direction in plan and has an actual inclination of  $50^\circ$  to the horizontal plane. It reveals the top and bottom surfaces of the stratum at altitudes of 85 m and 70 m, respectively.

- (a) Determine the dip, strike and thickness of the stratum.
- (b) Another skew bore-hole at B is drilled in a south-easterly direction in plan. The length of the hole as it goes through the stratum is 30 m. Determine the inclination of this bore-hole to the horizontal plane and find the distance from B to the top surface of the stratum along the bore-hole.

Scale 1 : 1000

6. Fig. 5 shows the outline plan of a roof which contains five hyperbolic paraboloid roof surfaces. The roof perimeter is square in plan. The corners A, B, C and D are at ground level, corners G and E are 12 m above ground level and corners F and H are 16m above ground level.

- (a) Draw the given plan of the hyperbolic paraboloid surfaces ABEF and EFGH and project an elevation.
- (b) Show the curvature of the roof along a line joining G to B.
- (c) Determine the traces of the plane director for the edges AF and BE of the surface ABEF and having its horizontal trace passing through B.



Scale 1 : 200

**Fig. 5**

7. The accompanying drawing shows ground contours at five-metre vertical intervals. AB is the line of a proposed roadway and CDEFG is a proposed parking area.

The roadway AB has the following specifications:-

- (i) formation width 15 m;
- (ii) formation level at A is 80 m;
- (iii) gradient A to B is 1 in 20 rising;
- (iv) side slopes for cuttings 1 in 1.5;
- (v) side slopes for embankments 1 in 2.

In the parking area the sides DE and GF are level and the gradient from C to D is 1 in 20 falling. The side slopes for cuttings and embankments are the same as for the roadway.

On the drawing supplied show the earthworks necessary to accommodate the roadway and parking area.

AN ROINN OIDEACHAIS  
SCRÚDÚ ARDTEISTIMÉIREACHTA, 1997  
LEAVING CERTIFICATE EXAMINATION, 1997

Scrúduimhir  
Examination Number

M. 85(L)

