

LEAVING CERTIFICATE EXAMINATION, 1988

TECHNICAL DRAWING - HIGHER LEVEL - PAPER II (B)

BUILDING APPLICATIONS

THURSDAY, 23 JUNE, - MORNING 9.30 to 12.30

(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 or millimetres.

1. Fig. 1 shows the outline plan and elevation of a hyperbolic paraboloid roof shell system.

- (a) Draw the given plan showing the nine elements in each direction on the surfaces and project the elevation showing the visible elements.
- (b) Determine the curvature of the roof along the diagonal AC.
- (c) Determine the traces of the plane director for one set of elements on the surface ABCD.

Scale 1 : 200.

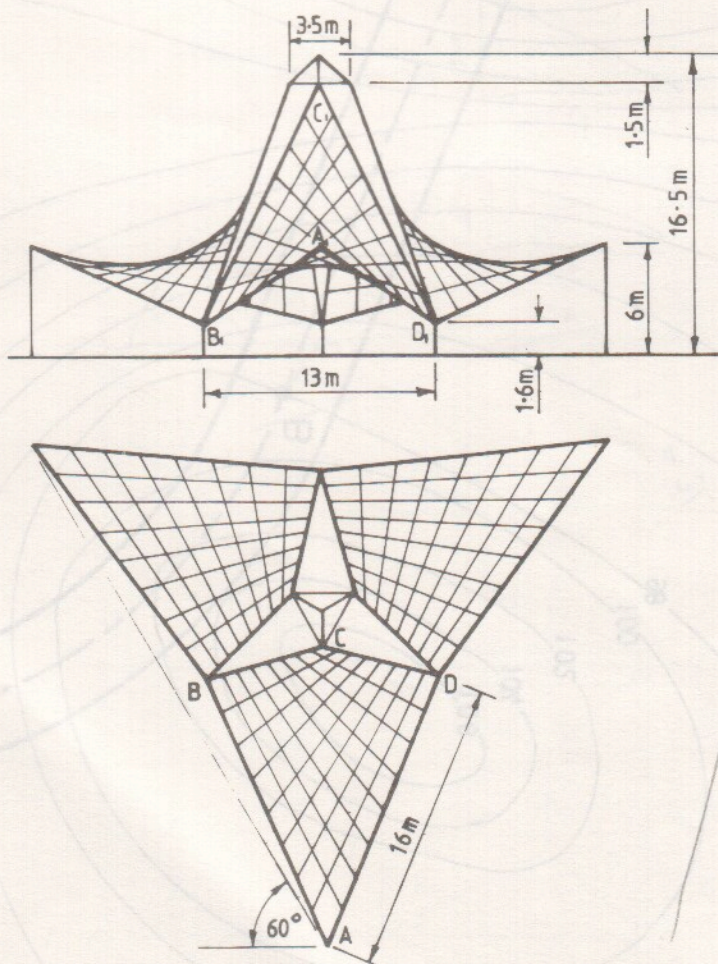


Fig. 1.

2. Fig. 2 shows the outline projections of a pitched roof. The surfaces A and B have a pitch of 45° and the surface C has a pitch of 25° .

- Draw the plan and elevation of the roof.
- Determine the dihedral angle between the surfaces A and C.
- Determine the dihedral angle between the surface B and the dormer surface D.

Scale 1 : 100.

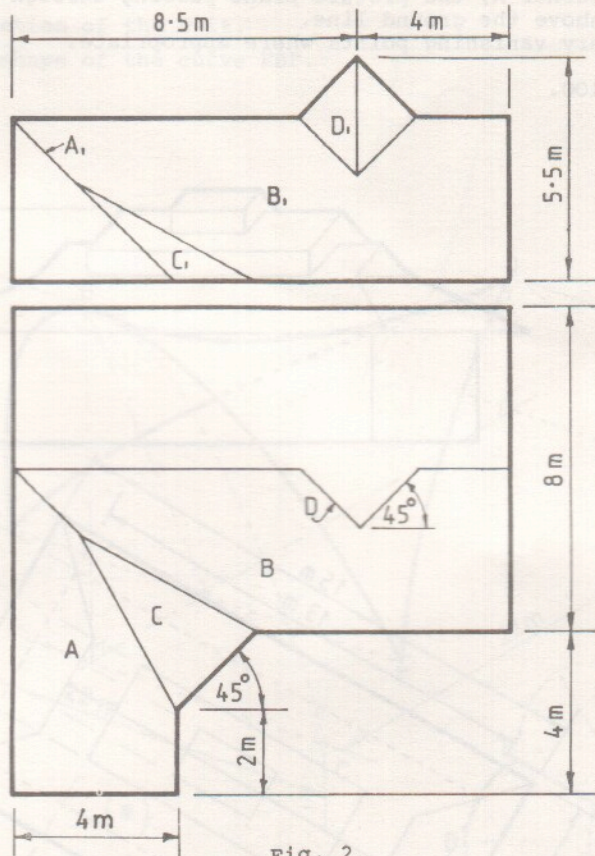


Fig. 2.

3. Fig. 3 shows the outline projections of a drinking fountain pedestal in stone. Draw the given plan and elevation and determine the shadows and shade on the elevation of the structure when the direction of the light is as shown in the figure. (Note: The shadows cast on the ground are not required.)

Scale 1 : 10.

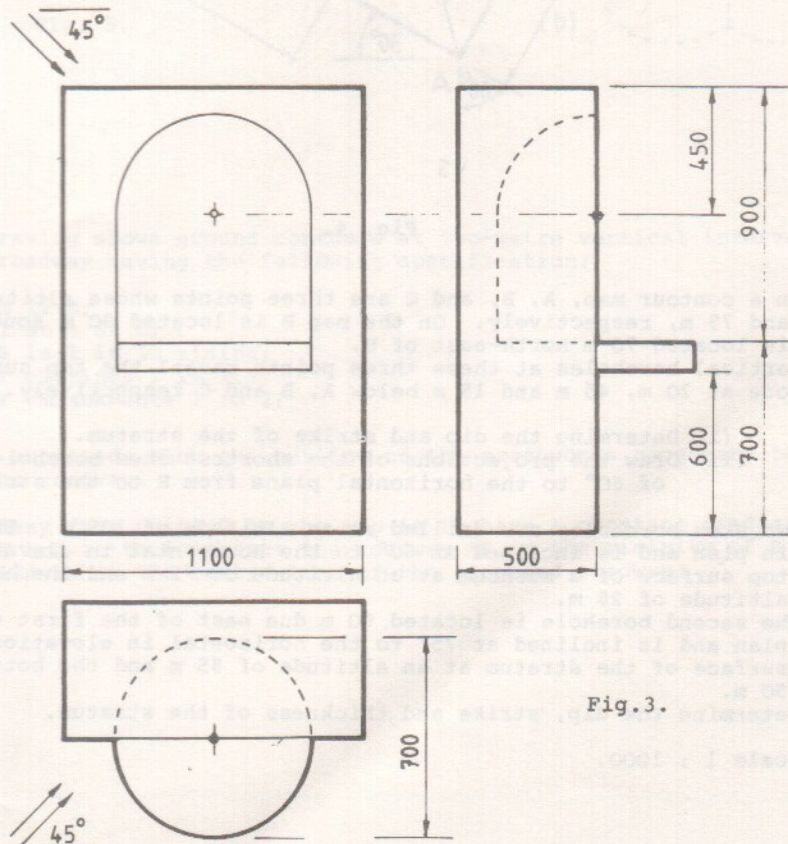


Fig.3.

4. Fig. 4 shows the outline plan and elevation of a building. All the roof surfaces have a pitch of 30° .

- Draw the given plan and project an auxiliary elevation which will show the heights of the roof surfaces.
- Draw a perspective view of the building when the position of the spectator is 8 m from corner A, the picture plane passing through corner B and the horizon line 5 m above the ground line. Use auxiliary vanishing points where appropriate.

Scale 1 : 100.

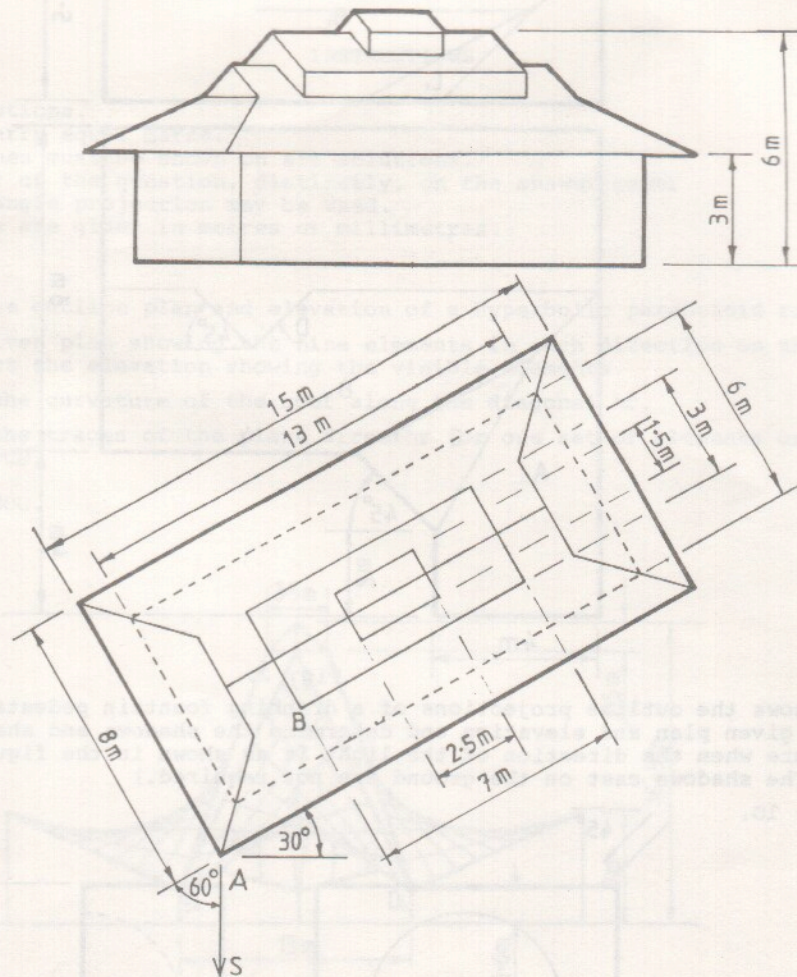


Fig. 4.

- On a contour map, A, B, and C are three points whose altitudes are 110 m, 80 m and 75 m, respectively. On the map B is located 90 m south-east of A and C is located 70 m north-east of B. Vertical boreholes at these three points reveal the top surface of a stratum of ore at 20 m, 45 m and 15 m below A, B and C respectively.
 - Determine the dip and strike of the stratum.
 - Draw the projections of the shortest skew borehole drilled at an angle of 60° to the horizontal plane from B to the stratum.
 - Two skew boreholes are drilled at an altitude of 105 m. The first runs south-east in plan and is inclined at 60° to the horizontal in elevation. It reaches the top surface of a stratum at an altitude of 72 m and the bottom surface at an altitude of 28 m. The second borehole is located 60 m due east of the first one and runs due east in plan and is inclined at 75° to the horizontal in elevation. It reaches the top surface of the stratum at an altitude of 85 m and the bottom at an altitude of 50 m. Determine the dip, strike and thickness of the stratum.

Scale 1 : 1000.

6. Fig. 5(a) shows a pictorial view of a shell structure unit. This unit is combined with five similar units to form a total roof surface as shown in plan in Fig. 5(b). The surface of the unit is generated by translating the parabola ABC in a vertical position along the parabola BD whose vertex is at D.

- (a) Draw the plan and elevation of the unit.
- (b) Project an end elevation of the unit.
- (c) Determine the true shape of the curve EBF.

Scale 1 : 200.

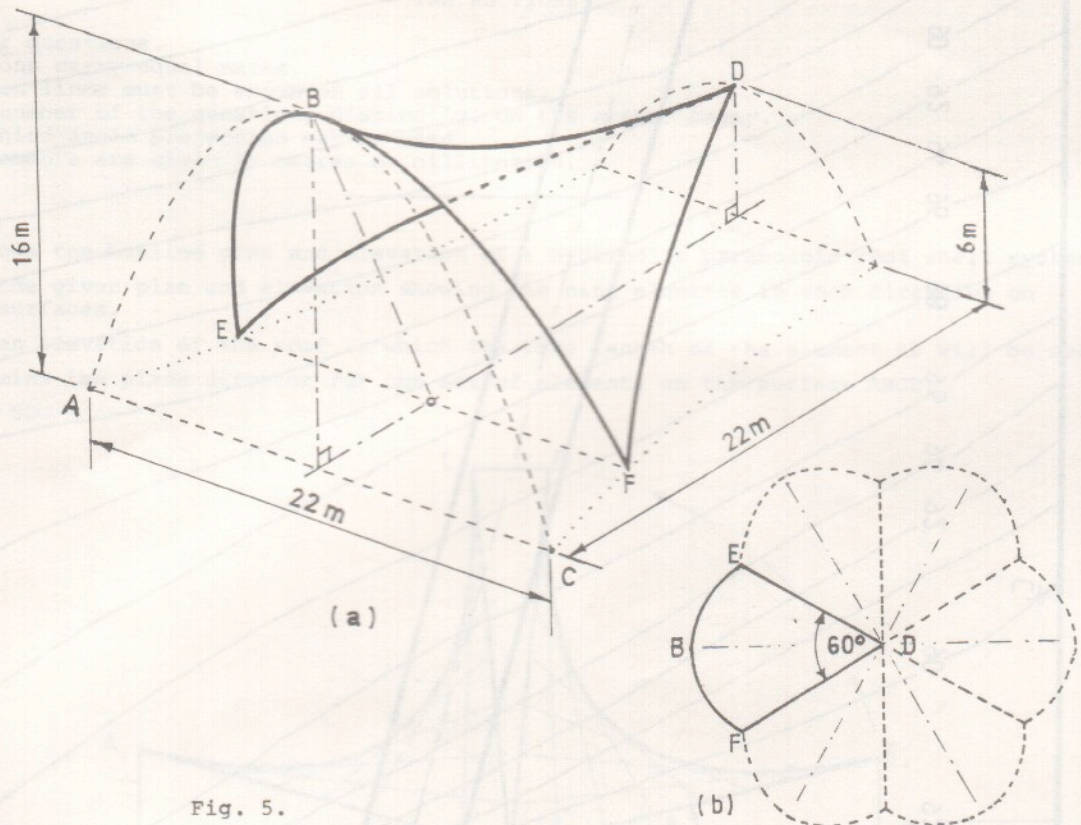


Fig. 5.

7. The accompanying drawing shows ground contours at two-metre vertical intervals. AB is the line of a proposed roadway having the following specification:

- (i) formation width 16 m;
- (ii) formation level at A 88 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;

- (a) On the drawing supplied, show the outline of the earthworks necessary to accommodate the roadway.
- (b) A proposed roadway from point C on the map is to have a constant gradient of 1 in 20 rising and is to intersect the roadway AB in the vicinity of B. On the drawing supplied, show the centre-line of the proposed roadway.

SCRÚDÚ ARDTEISTIMEIREACHTA, 1988

Scrúinimhir
Examination Number

LEAVING CERTIFICATE EXAMINATION, 1988

