AN ROINN OIDEACHAIS

LEAVING CERTIFICATE EXAMINATION, 1992

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

MONDAY, 22 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.

1. Draw a perspective view of the structure shown in Fig. 1.
The picture plane passes through the corner A, the spectator S is 7 m from the corner A and the horizon line is 8 m above the ground line.
Use auxiliary vanishing points, where appropriate.

Scale 1:100

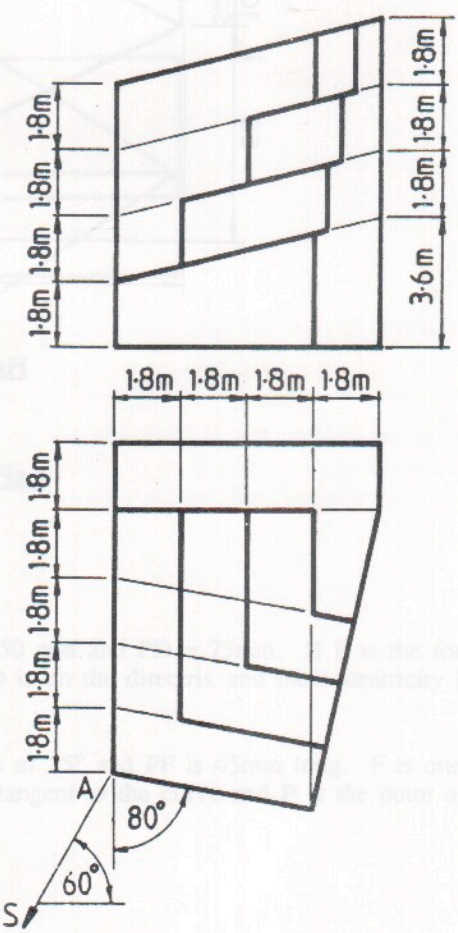


Fig. 1

2. Fig. 2 shows the plan and elevation of a pitched roof containing a dormer window. The surfaces B and C have a pitch of 40° and the dihedral angle between the surfaces A and B is 130°.
The true shape of each of the dormer surfaces D and E is an equilateral triangle.
Draw the given plan and elevation and find the dihedral angle between the surfaces B and E.

Scale 1:100.

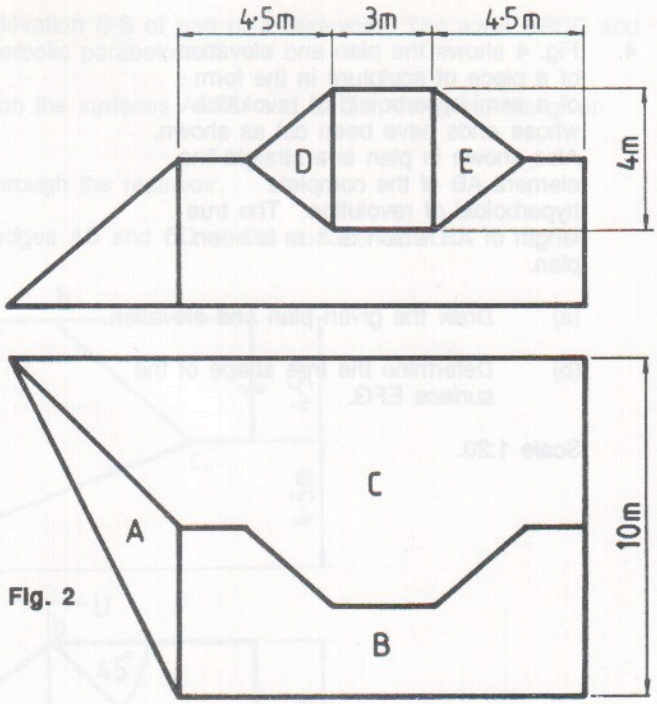


Fig. 2

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

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

Scale 1:200

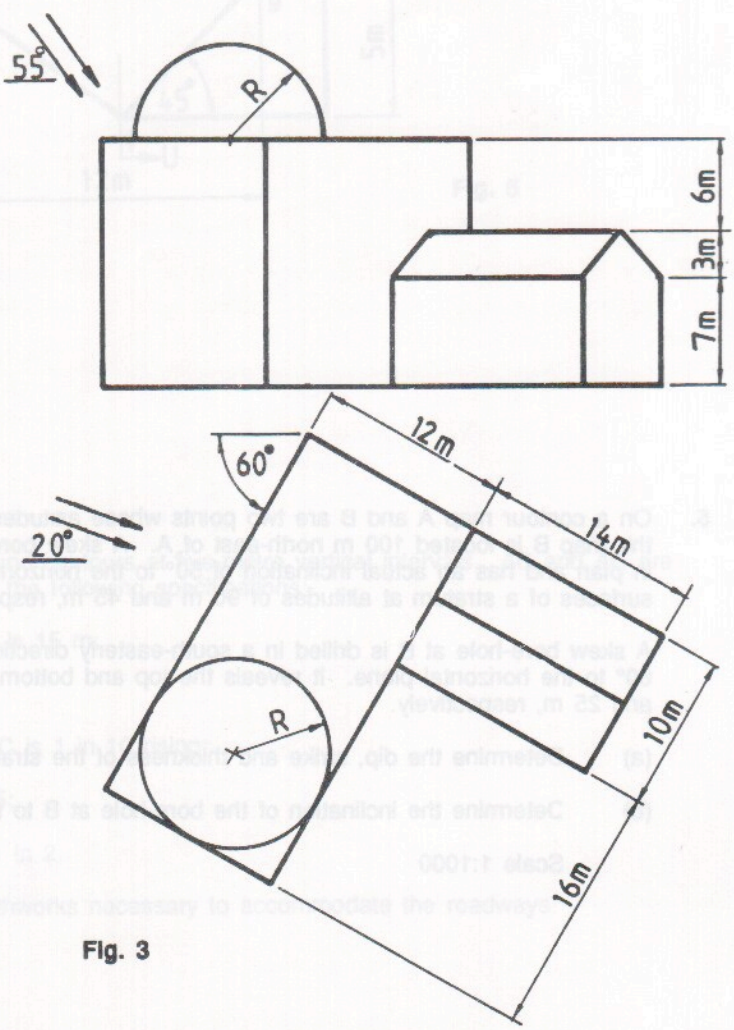


Fig. 3

4. Fig. 4 shows the plan and elevation of a piece of sculpture in the form of a semi-hyperboloid of revolution whose ends have been cut as shown. Also, shown in plan is a straight-line element AB of the complete hyperboloid of revolution. The true length of AB which is 3 m is seen in plan.

(a) Draw the given plan and elevation.

(b) Determine the true shape of the surface EFG.

Scale 1:20.

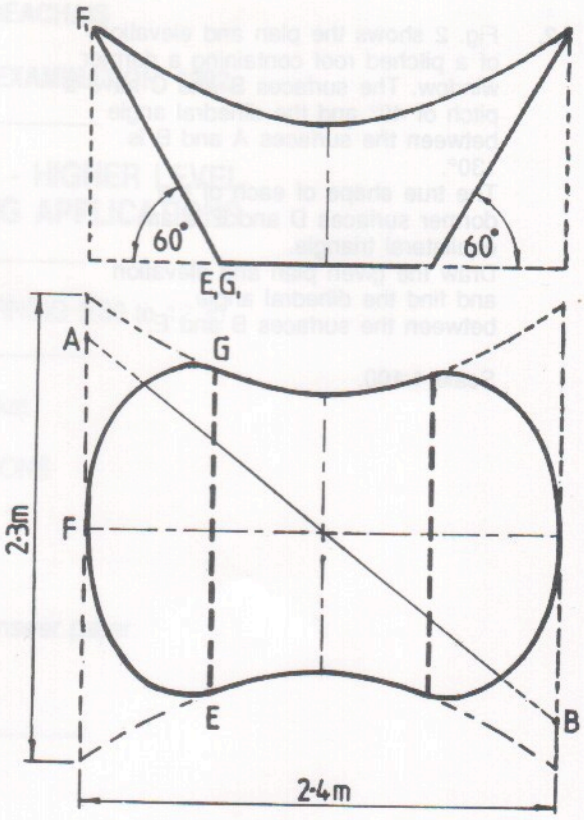


Fig. 4

5. On a contour map A and B are two points whose altitudes are 105 m and 85 m, respectively. On the map B is located 100 m north-east of A. A skew bore-hole at A is drilled in a northerly direction in plan and has an actual inclination of 50° to the horizontal plane. It reveals the top and bottom surfaces of a stratum at altitudes of 90 m and 45 m, respectively.

A skew bore-hole at B is drilled in a south-easterly direction in plan and has an actual inclination of 60° to the horizontal plane. It reveals the top and bottom surfaces of the stratum at altitudes of 55 m and 25 m, respectively.

(a) Determine the dip, strike and thickness of the stratum.

(b) Determine the inclination of the bore-hole at B to the stratum.

Scale 1:1000

6. Fig. 5 shows the outline plan and sectional elevation S-S of part of a reservoir. The walls ABCD and EFGH of the reservoir are in the form of hyperbolic paraboloids.

(a) Using six elements in each direction on the surfaces ABCD and EFGH, complete the given plan and sectional elevation.

(b) Draw the vertical cross-section U-U through the reservoir.

(c) Determine the plane director for the edges AB and CD on the surface ABCD.

Scale 1:100.

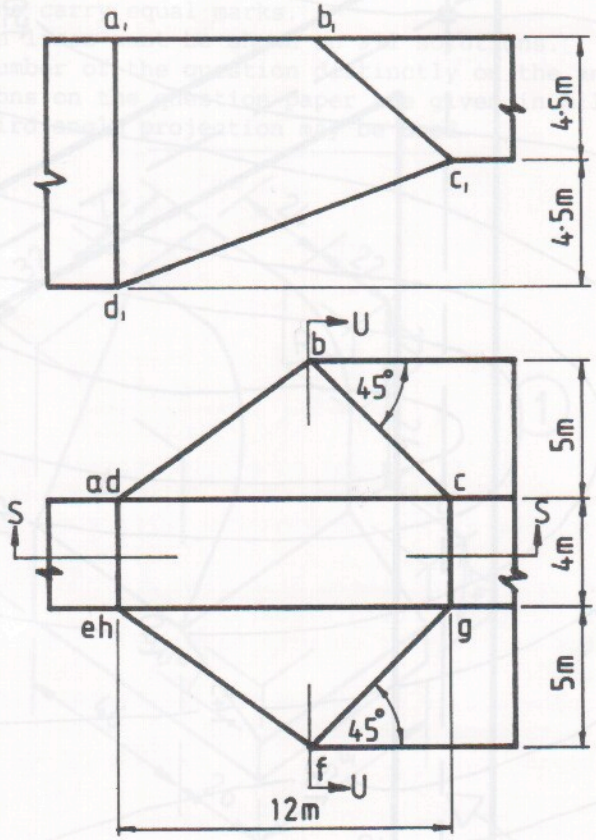


Fig. 5

7. The accompanying drawing shows ground contours at five-metre vertical intervals. AB and AC are the lines of proposed roadways having the following specifications:-

(i) formation width for AB and AC is 15 m;

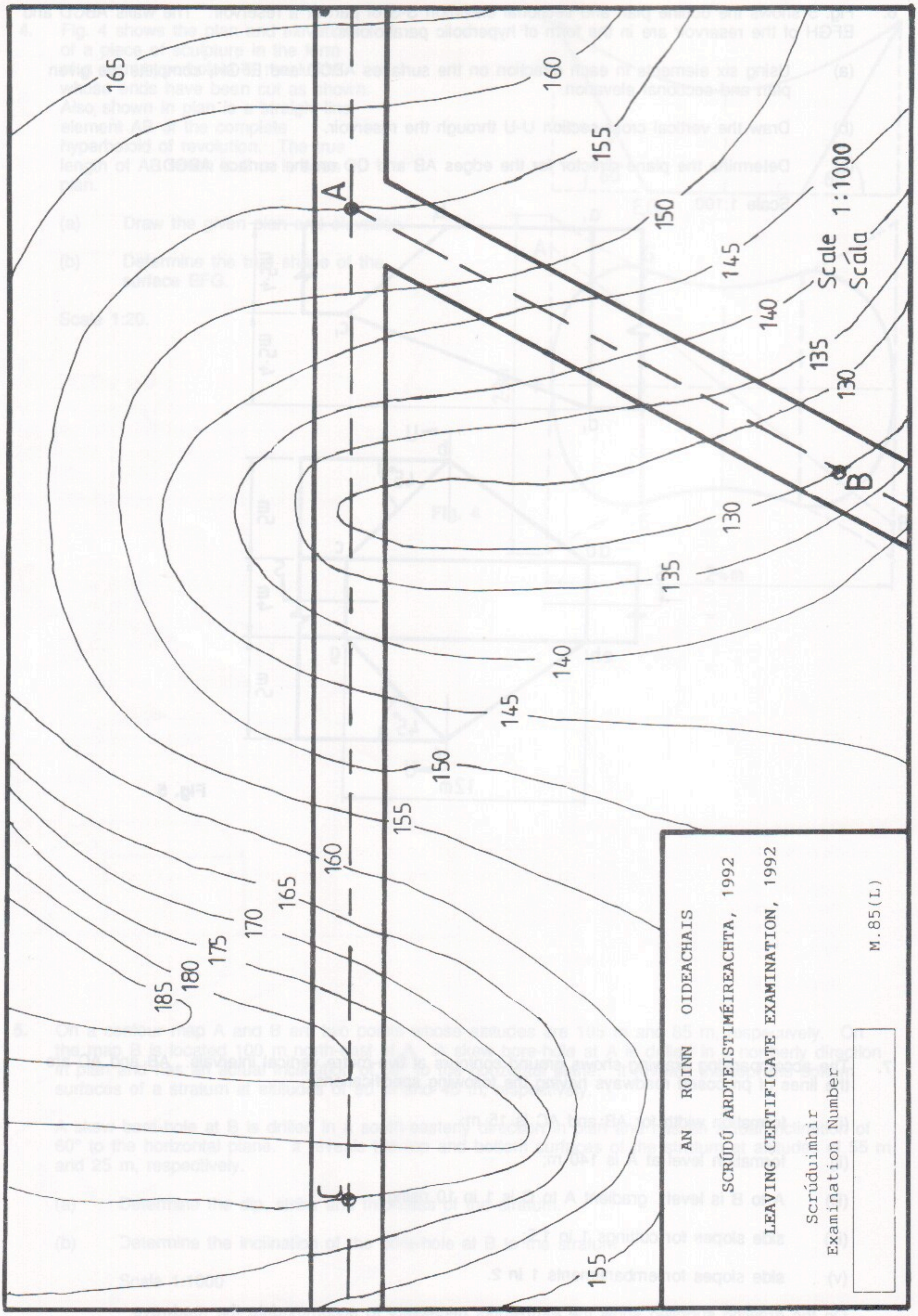
(ii) formation level at A is 140 m;

(iii) A to B is level; gradient A to C is 1 in 10 rising;

(iv) side slopes for cuttings 1 in 1.5;

(v) side slopes for embankments 1 in 2.

On the drawing supplied show the earthworks necessary to accommodate the roadways.


A
B
Scale 1:1000
Scála
185
180
175
170
165
160
155
150
145
140
135
130
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