

AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

LEAVING CERTIFICATE EXAMINATION 2002

**TECHNICAL DRAWING – HIGHER LEVEL – PAPER II (B)**

**BUILDING APPLICATIONS**

Friday 14<sup>th</sup> 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 numbers of the questions, distinctly, on the answer paper.
- (e) First or third angle projection must 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 10m from the corner A and the horizon line 9m above the ground line.

Use auxiliary vanishing points where appropriate.

Scale 1:100

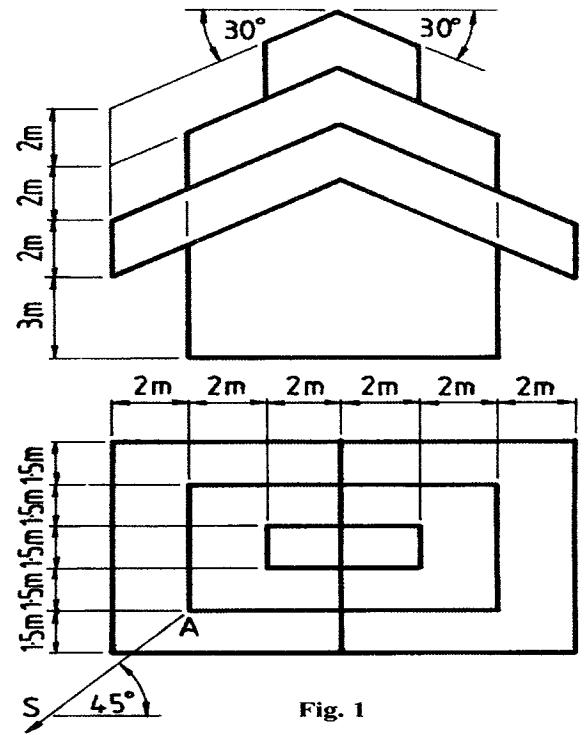


Fig. 1

2. Fig 2 shows the outline plan and elevation of roof surfaces and a dormer window. Surface A has a pitch of  $40^\circ$  and surface B has a pitch of  $35^\circ$ . The dihedral angle between the surfaces B and C is  $110^\circ$ . The dihedral angle between the horizontal surface E and the sloping dormer surfaces D and F is  $125^\circ$ .

- (a) Draw the given plan and elevation.
- (b) Determine the dihedral angle between the surfaces A and B.

Scale 1:200

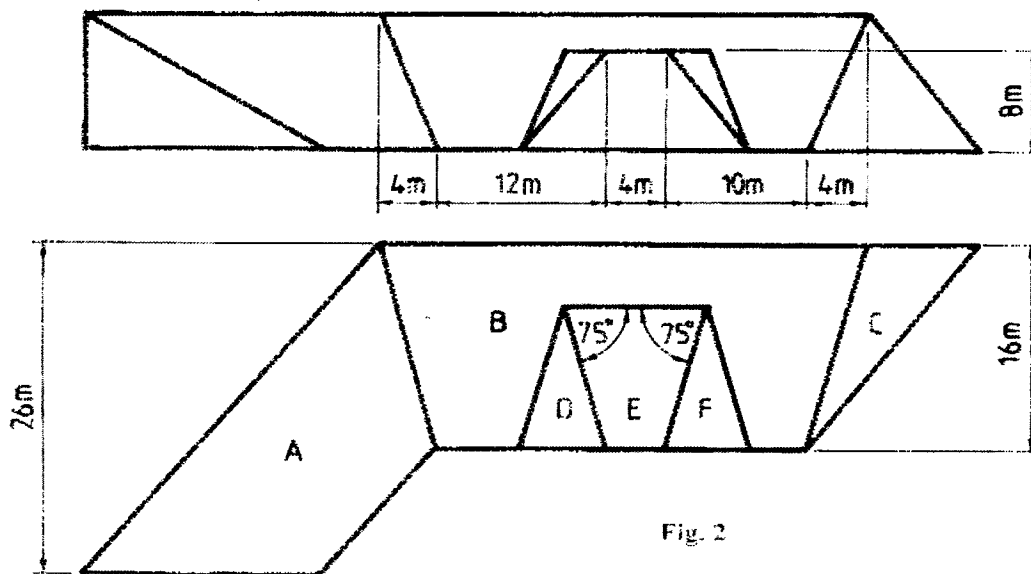


Fig. 2

3. Fig 3 shows the outline plan and elevation of a concrete structure. Draw the given views and determine the shadows and shade in plan when the direction of light is as shown in the figure.

Scale 1:100

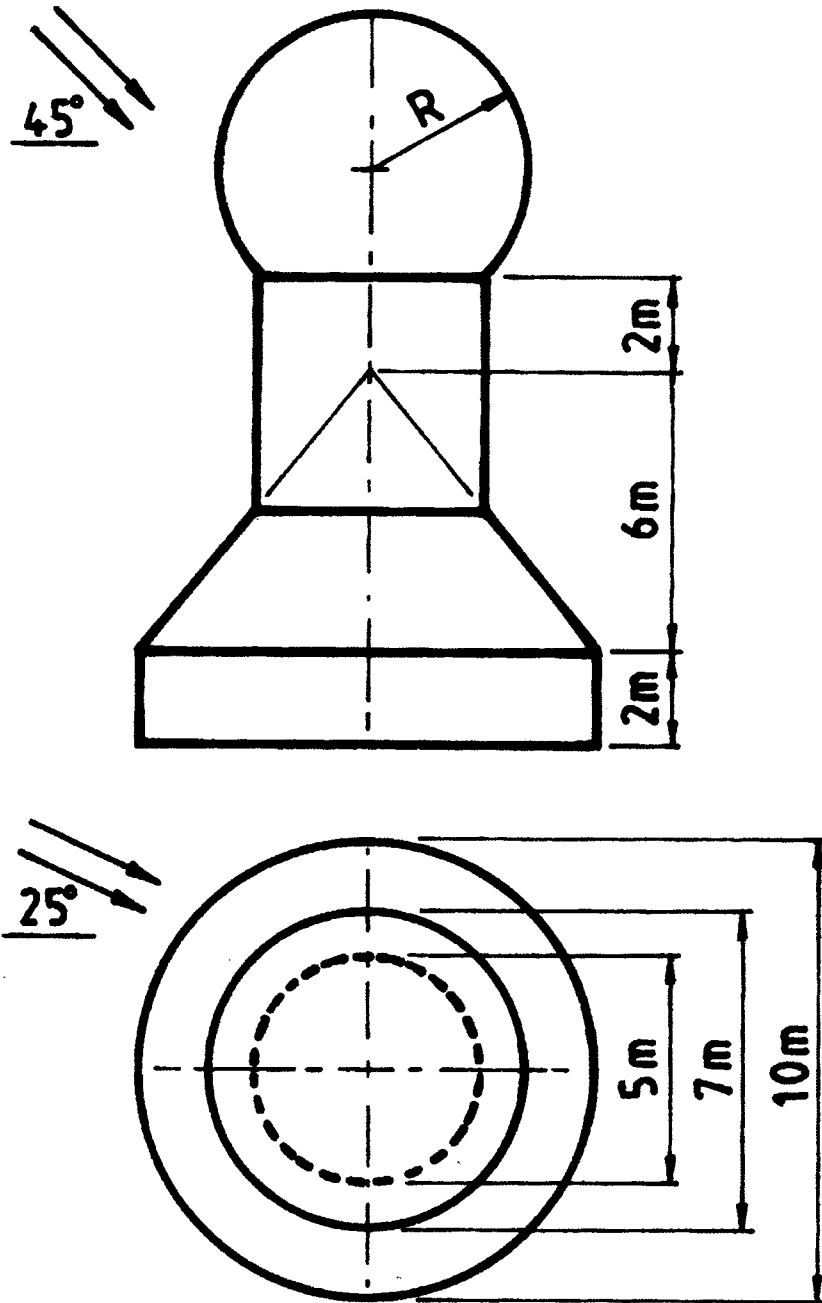


Fig. 3

4. Fig 4 shows the plan and elevation of a structure in the form of a semi – hyperboloid of revolution whose ends have been cut as shown. A tower which projects from the structure is also shown. The true lengths of all straight line elements of the complete hyperboloid of revolution are 38m.

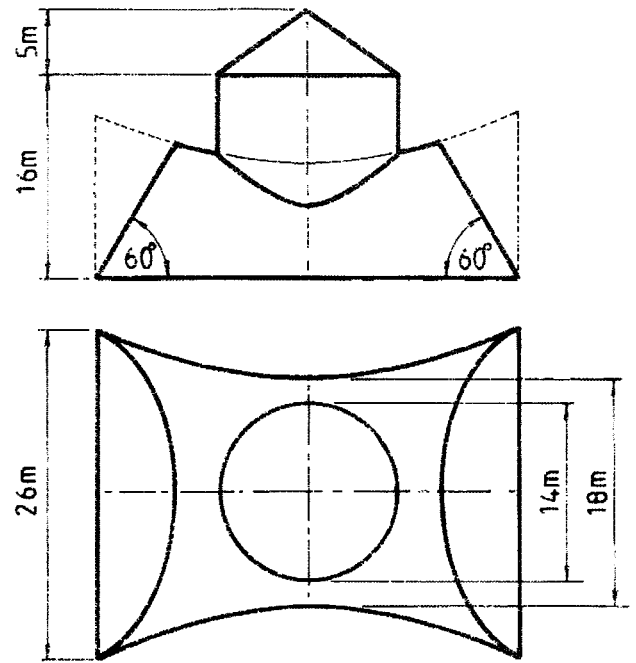


Fig. 4

Draw the given plan and elevation of the structure.

Scale 1:200.

5. On a contour map A and B are two points whose altitudes are 100m and 110m respectively. On the map B is located 85m north-east of A. A skew bore-hole at A is drilled in a north-easterly direction in plan and has an actual inclination of  $60^\circ$  to the horizontal plane. It reveals the top and bottom surfaces of a stratum of distances 35m and 100m respectively from A.

A skew bore-hole at B is drilled in a south-easterly direction in plan and has an actual inclination of  $50^\circ$  to the horizontal plane. It reveals the top and bottom surfaces of a stratum at distances of 45m and 95m respectively from B.

- (a) Determine the dip, strike and thickness of the stratum.
- (b) Another skew bore-hole at A is drilled in a south-westerly direction in plan and has a true inclination of  $45^\circ$  to the bore-hole already drilled at A. Determine the distance from A to the bottom surface of the stratum along this bore-hole and also find its true inclination to the stratum.

Scale 1:1000

6. Fig 5. shows the outline plan and elevation of a hyperbolic paraboloid roof. The perimeter of the roof is a circle in plan. The roof is formed by extending the hyperbolic paraboloid surface ABCD.

- (a) Draw the plan and elevation of the roof.
- (b) Determine the true shape of section S-S through the structure.
- (c) Determine the traces of the plane director for the elements AD and BC, having its horizontal trace passing through B.

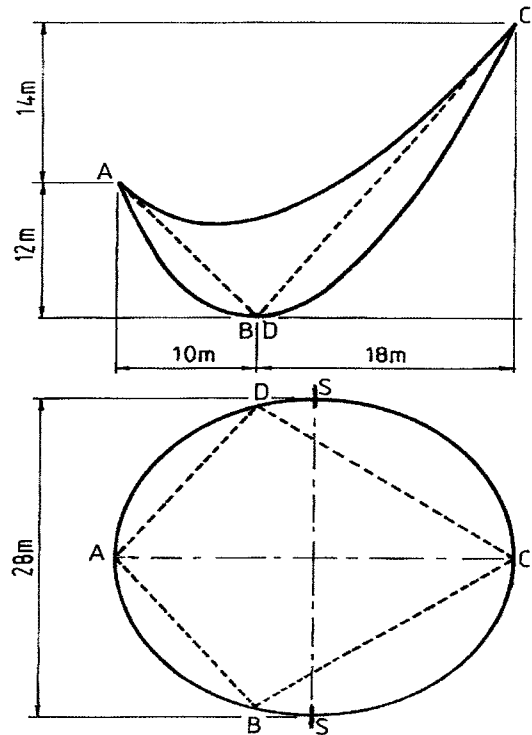


Fig. 5

Scale 1:200

7. The accompanying drawing shows ground contours of five metre vertical intervals. ABC and BD are the lines of proposed roadways having the following specifications:

- (i) formation width for ABC and BD is 14m;
- (ii) formation level at B is 45m;
- (iii) gradient A to C is 1 in falling; gradient B to D is 1 in 12 rising;
- (iv) side slopes of cutting 1 to 1.5;
- (v) side slopes for embankments 1 to 2.

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

(M85L)

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SCRÚDÚ ARDTEISTIMÉIREACHTA, 2002  
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Serúduimhir:  
Examination Number:

40 45

D

B

A

50 55 60 65 70 75 80 85 90 95 100

Scale 1:1000  
Scála

