AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

LEAVING CERTIFICATE EXAMINATION 2002

TECHNICAL DRAWING – HIGHER LEVEL – PAPER II (B)

BUILDING APPLICATIONS

Friday 14th 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.

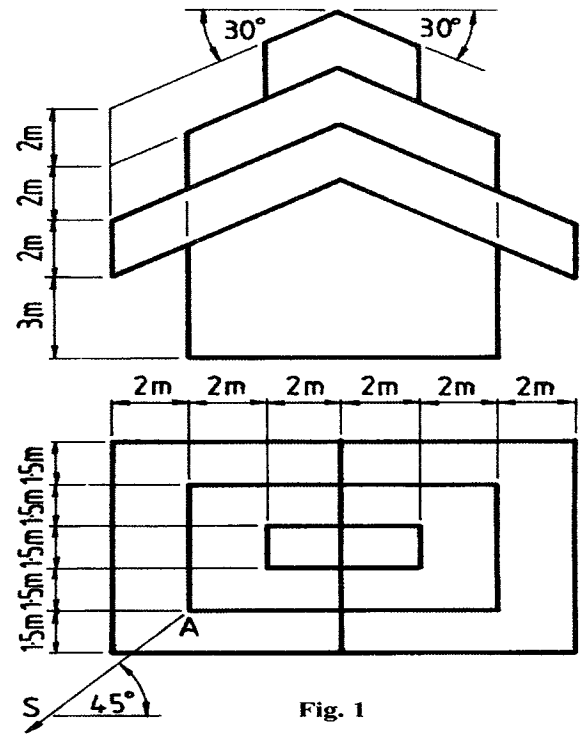Use auxiliary vanishing points where appropriate.

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° and surface B has a pitch of 35°. The dihedral angle between the surfaces B and C is 110°. The dihedral angle between the horizontal surface E and the sloping dormer surfaces D and F is 125°.

   (a) Draw the given plan and elevation.

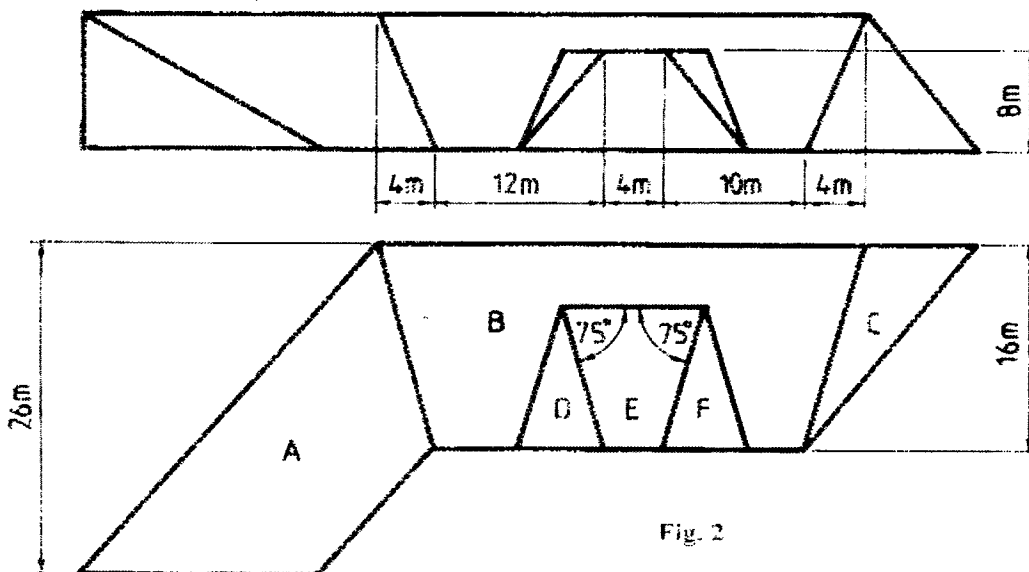   (b) Determine the dihedral angle between the surfaces A and B.

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.
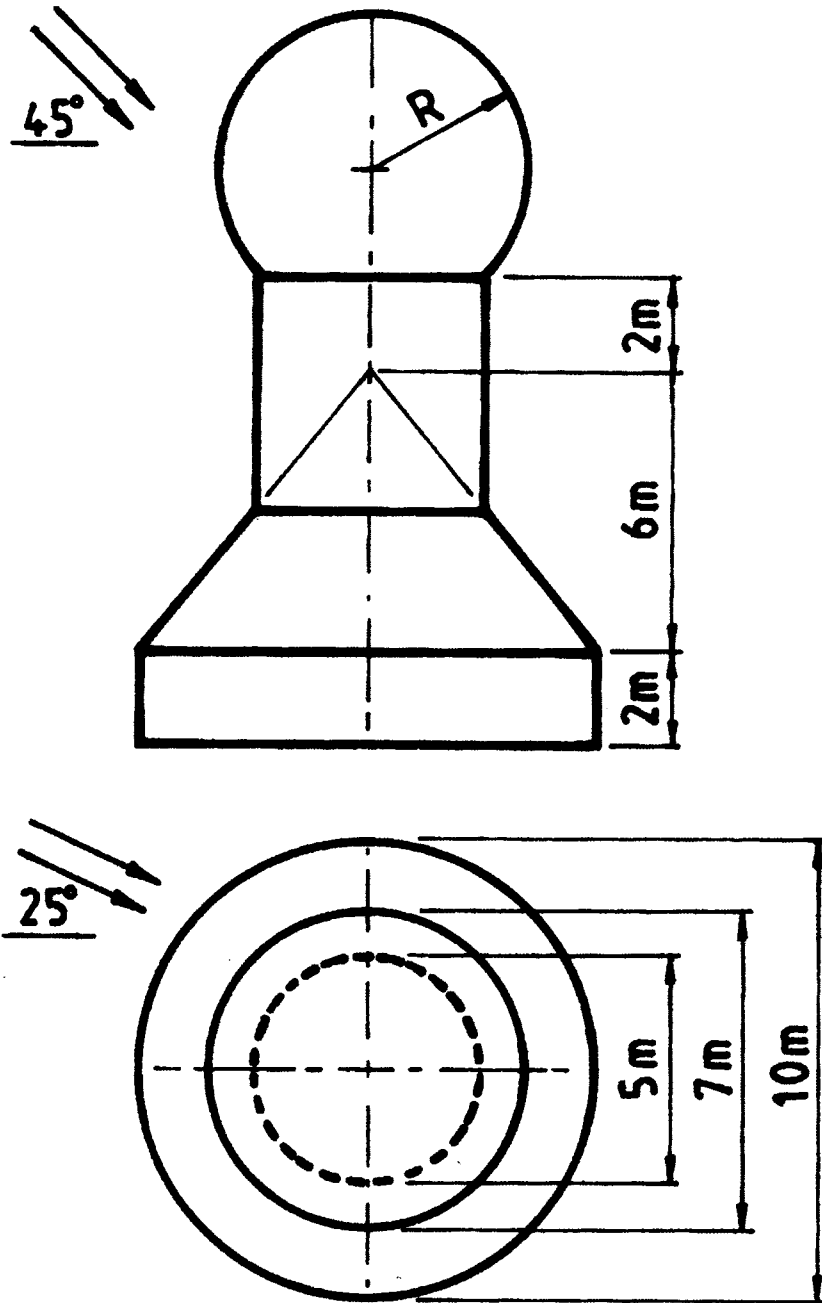
Scale 1:100

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.
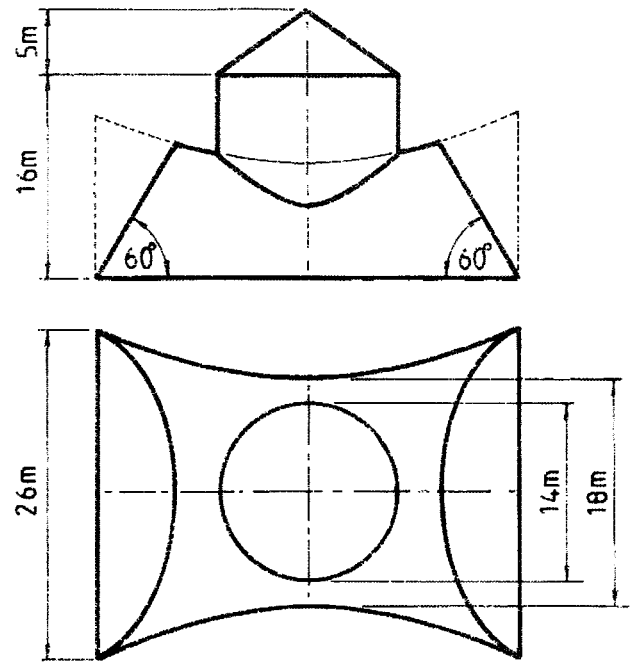
Draw the given plan and elevation of the structure.

Fig. 4

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° to the horizontal plane. It reveals the top and bottom surfaces of as 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° 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° 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.
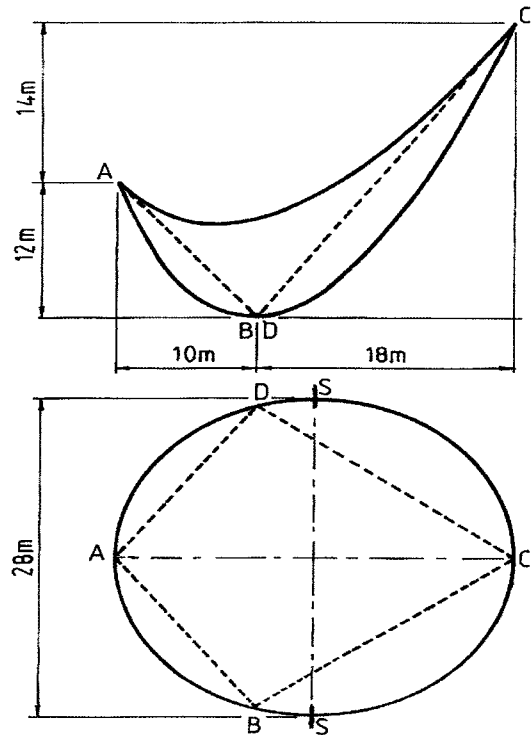
Scale 1:200

Fig. 5

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 I 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.

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SCRÚDÚ ARDTEISTIMÉIREACHTA, 2002
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Scrúduimhir:
Examination Number:

Scale
Scála 1 : 1000

A

B

C

D

40 45