Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2008

Technical Drawing
Paper II(B) – Higher Level (Building Applications)
(200 Marks)

Monday 16 June
Afternoon, 2.00 – 5.00

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) Work on one side of the paper only.
(f) All dimensions on the question paper are given in metres or millimetres.
(g) First or third angle projection may be used.

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 is 10m above the ground line.

Use auxiliary vanishing points where appropriate.
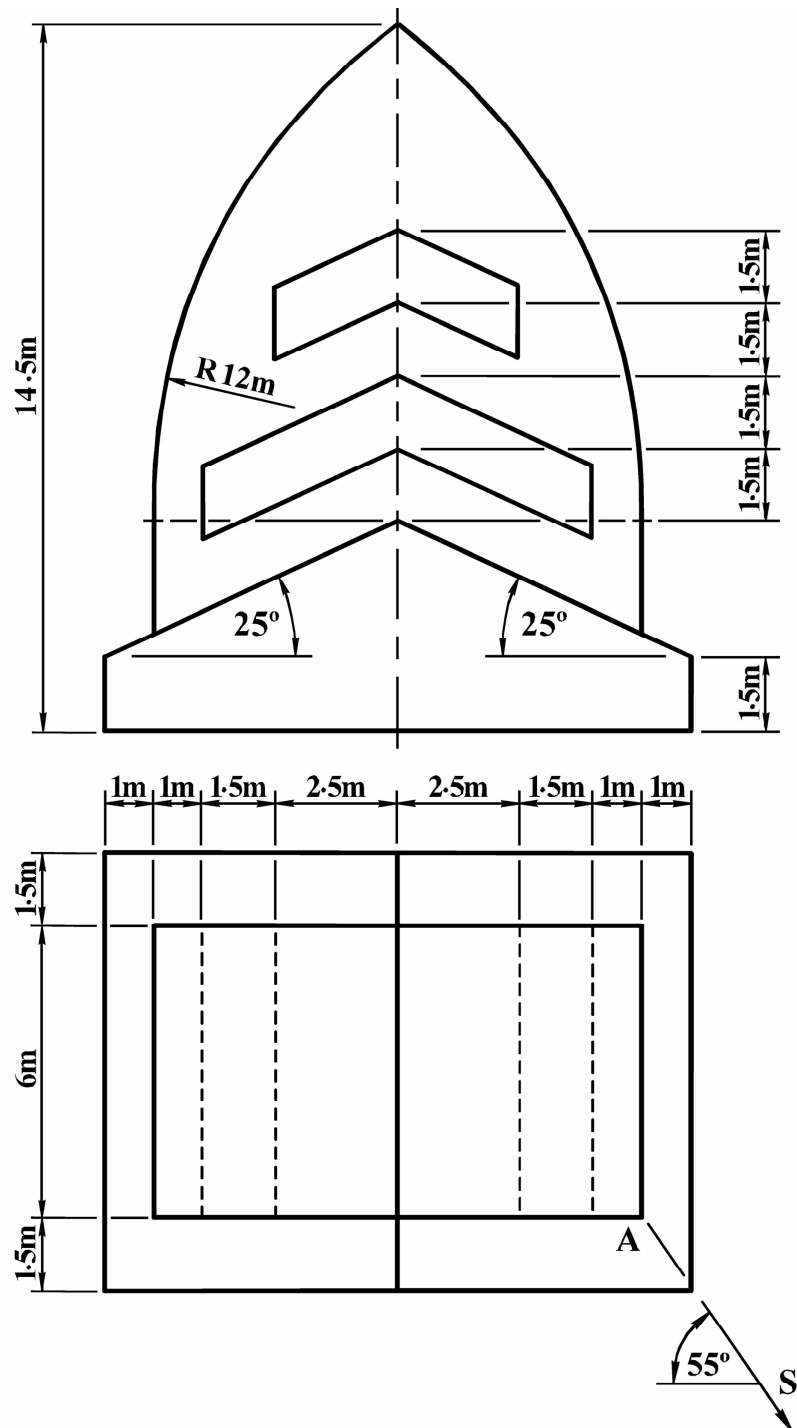
Scale 1 : 100

Fig. 1

2. Fig. 2 shows the outline plan, elevation and end elevation of roof surfaces.

   (a) Surfaces A and B have a pitch of 60° and surface C has a pitch of 30°. Draw the plan and elevation of roof surface A and determine the dihedral angle between surfaces A and B.

   (b) The dihedral angle between surfaces B and D is 120°. Draw the plan and elevation of surface D.

   (c) Surfaces F and G have a pitch of 65°. Complete the given projections of the roof.
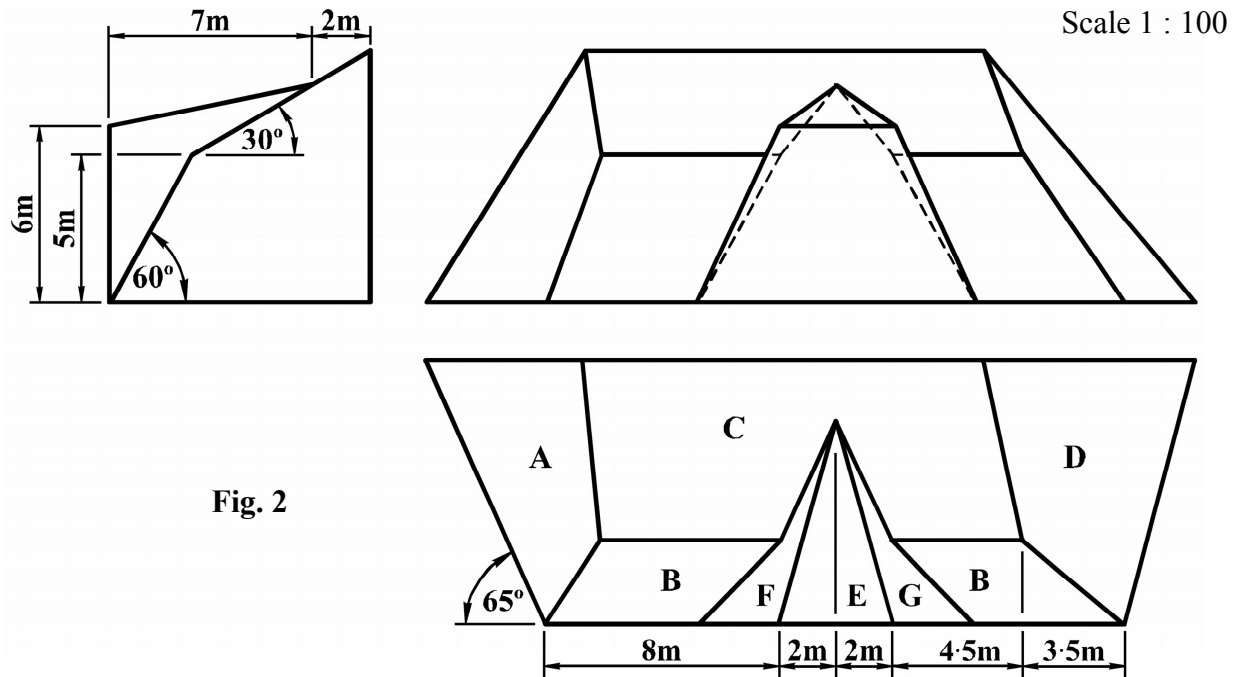
Scale 1 : 100

Fig. 2

3. Fig. 3 shows the plan and elevation of two adjoining buildings.

   Draw the given plan and elevation and determine the shadows and shade in plan and elevation when the direction of the light is as shown.
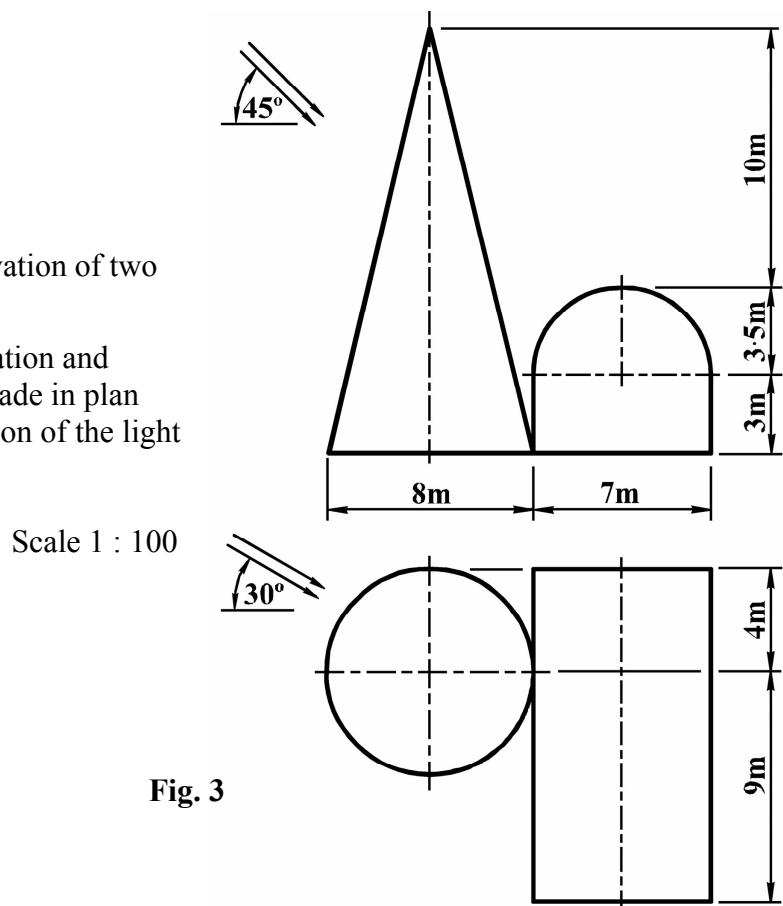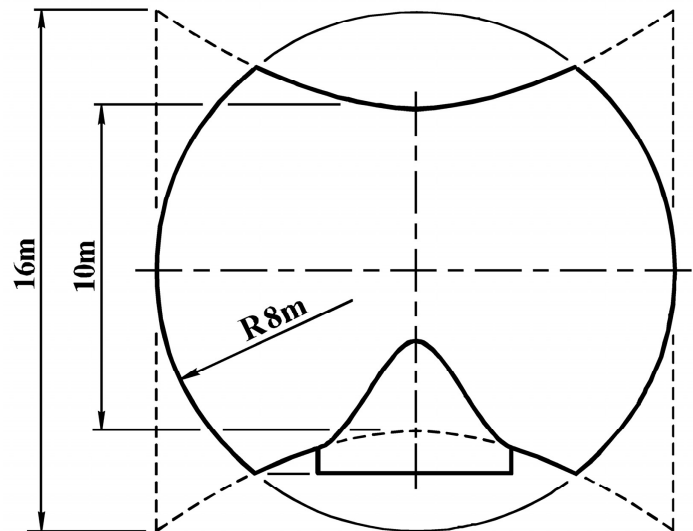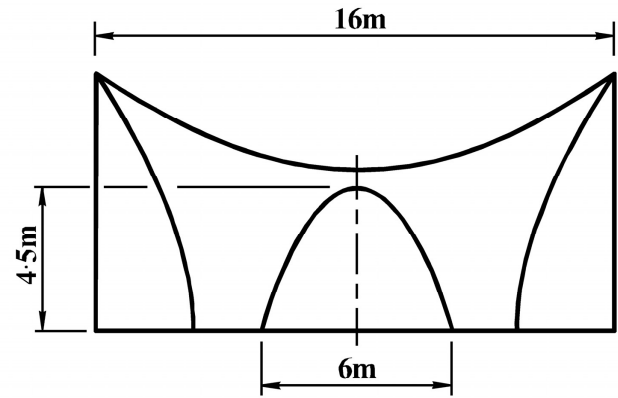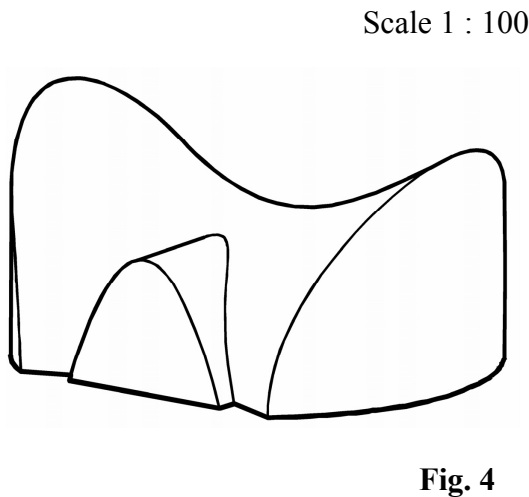
Scale 1 : 100

Fig. 3

4. Fig. 4 shows the plan, elevation and pictorial sketch of a building in the form of a semi-hyperboloid of revolution, the ends of which have been shaped as shown.

The outline of an entrance which projects from the main building is also shown. The entrance is parabolic in elevation.

Draw the given plan and elevation of the building.

Scale 1 : 100

Fig. 4

5. **(a)** On a contour map, A and B are two points with altitudes of 120m and 115m respectively. On the map, B is located 130m east of A. A skew bore-hole at A 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 altitudes of 80m and 65m, respectively.

A skew bore-hole at B is drilled in a north-westerly direction in plan and has an actual inclination of 65° to the horizontal plane. It reveals the top and bottom surfaces of the stratum at altitudes of 100m and 35m, respectively.

Determine the dip, strike and thickness of the stratum.

(b) On another map, R and S are two points with altitudes of 95m and 110m respectively. On the map S is located 110m south-east of R. A vertical bore-hole is drilled at S and it reaches the top surface of a stratum at an altitude of 85m.

A bore-hole at R is drilled in a south-easterly direction in plan and has an actual inclination of 60° to the horizontal plane. The stratum has a strike of north 75° west, a thickness of 25m and a dip of 40° in a general north-easterly direction.

Determine the distance from R to the bottom surface of the stratum along the bore-hole at R and find the inclination of this bore-hole to the stratum.

Scale 1 : 1000

6. Fig. 5 shows the outline plan and elevation of a roof. R and S are plane roof surfaces. The hyperbolic paraboloid surface AEFD is an extension of the smaller hyperbolic paraboloid surface ABCD.

(a) Draw the given plan and elevation.

(b) Determine the curvature of the roof along a line from A to C.

(c) A plane director for the elements AB and DC is positioned so that it contains point A. Draw the traces for this plane director and determine the shortest distance from the point D to the plane director.
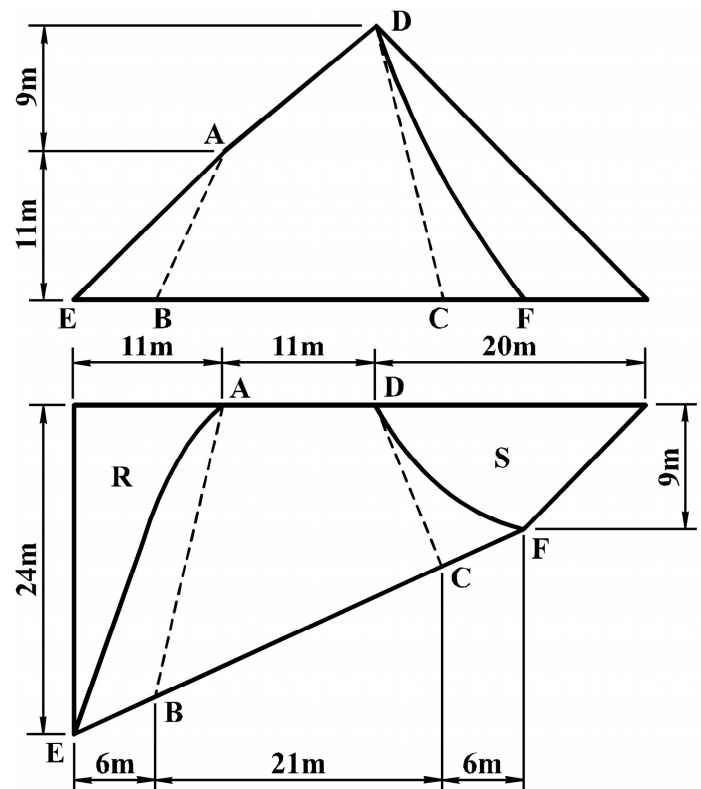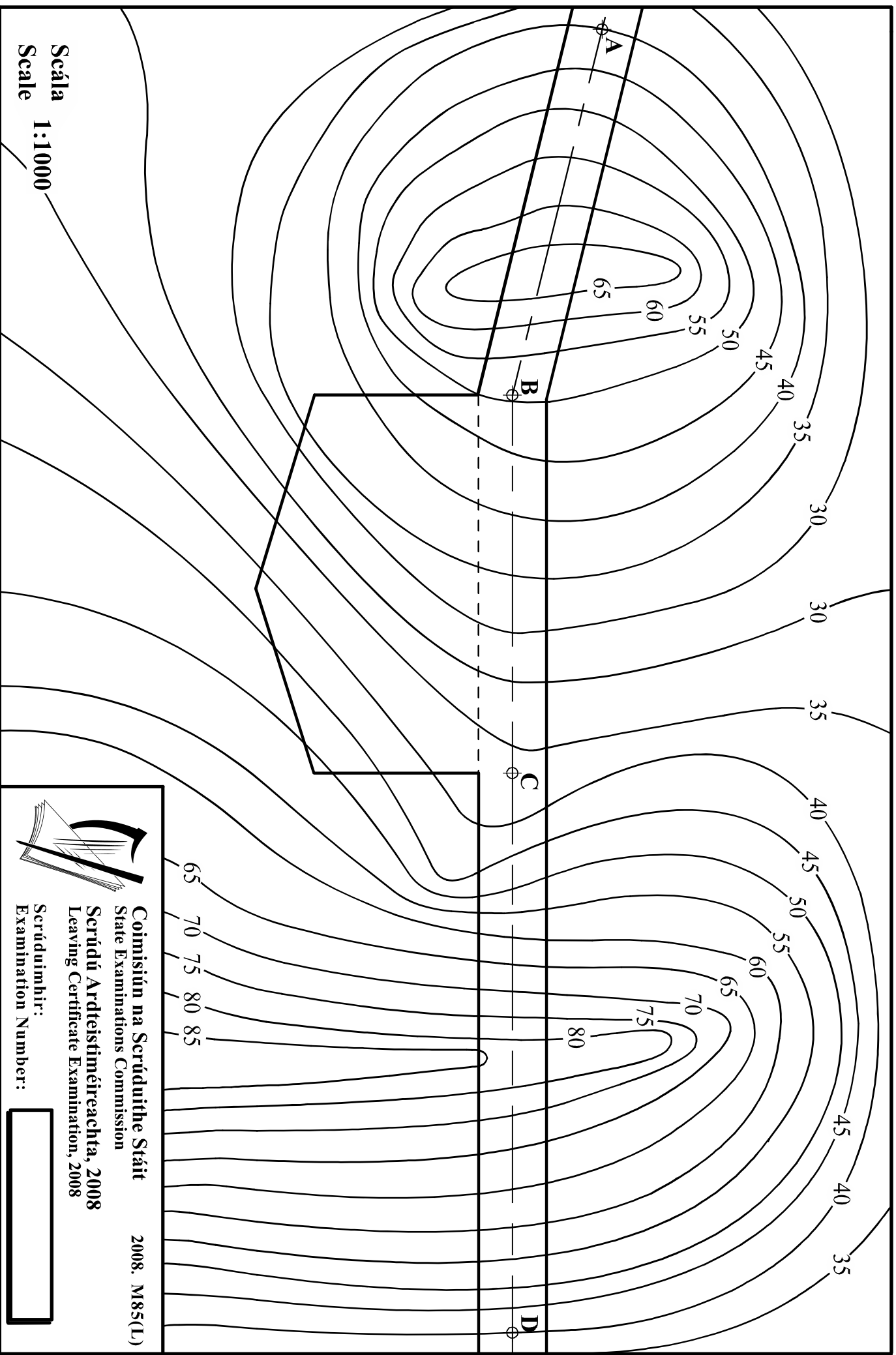
Scale 1 : 200

Fig. 5

7. The accompanying drawing shows ground contours at five-metre vertical intervals. ABCD is the line of a proposed roadway which is widened between B and C to form a parking area.

The roadway has the following specification:-

(i)   formation widths are as shown;

(ii) formation level at B is 50m;

(iii) A to B is level;

(iv) gradient B to D is 1 in 16 rising;

(v)   side slopes for embankments are 1 in 1.5;

(vi) side slopes for cuttings are 1 in 1.

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

A

B

C

D

65
60
55
50
45
40
35
30

30

35

40
45
50
55
60
65
70
75
80
85

65
70
75
80
85

80
75
70
65
60
55
50
45
40

35

35

45
40