Coimisiún na Scrúduithe Stáit
State Examinations Commission

Leaving Certificate Examination 2007

Technical Drawing

Paper II(B) – Higher Level
(Building Applications)

(200 Marks)

Friday 15 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 shelter shown in Fig. 1. The picture plane passes through the corner A, the spectator S is 2·2m from corner A and the horizon line is 1·6m above the ground line.

Use auxiliary vanishing points where appropriate.

Scale 1 : 20

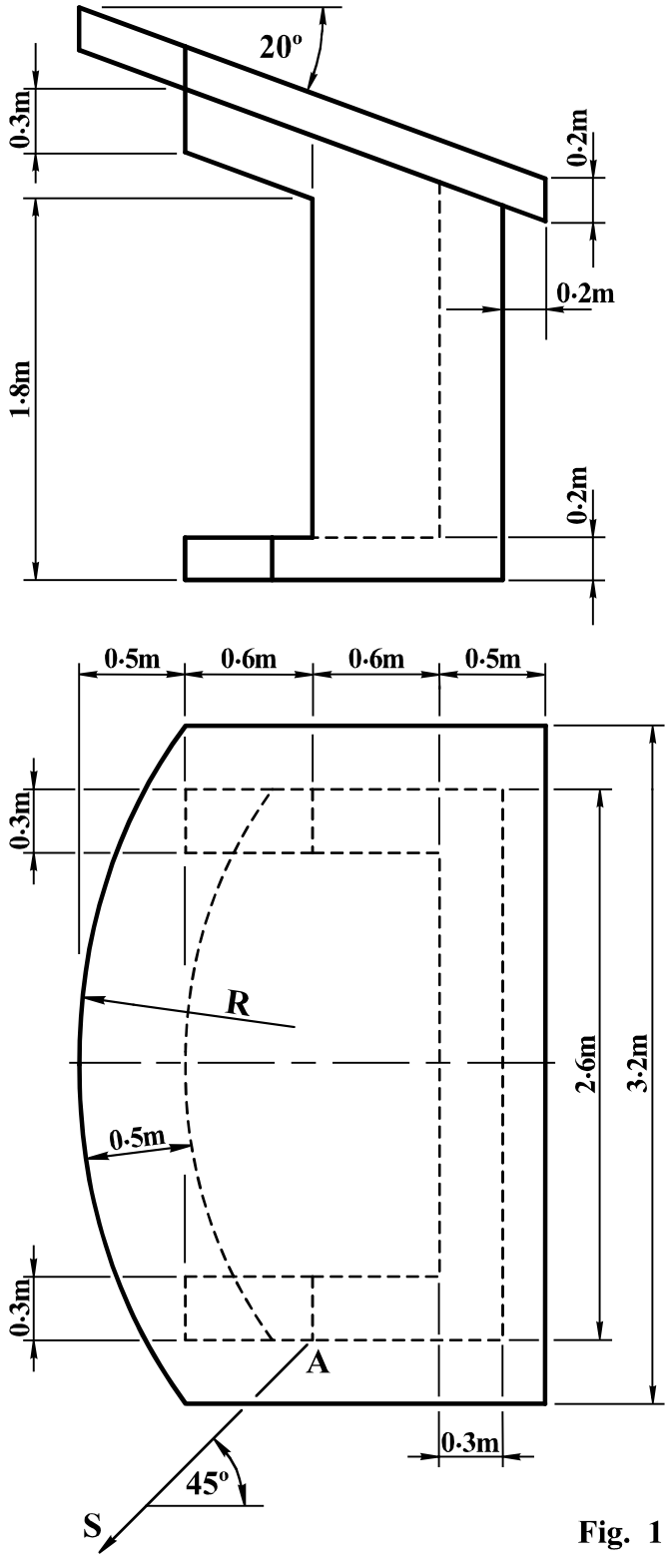


Fig. 1

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

(a) Surfaces A and C have pitches of 40° and 50° respectively. Draw the plan and elevation of roof surface A.

(b) Surface B has a pitch of 45°. Draw the plan and elevation of roof surface B and determine the dihedral angle between surfaces A and B.

(c) The dihedral angle between the surfaces A and D is 120°. Complete the plan and elevation of surfaces C and D.

(d) The dihedral angle between the surfaces E and F is 140°. Complete the plan and elevation of the roof.

Scale 1 : 100

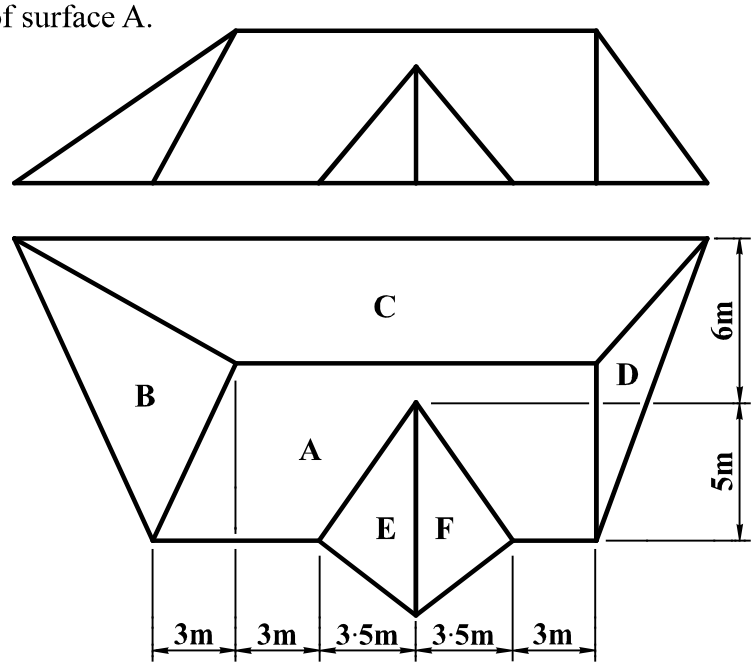


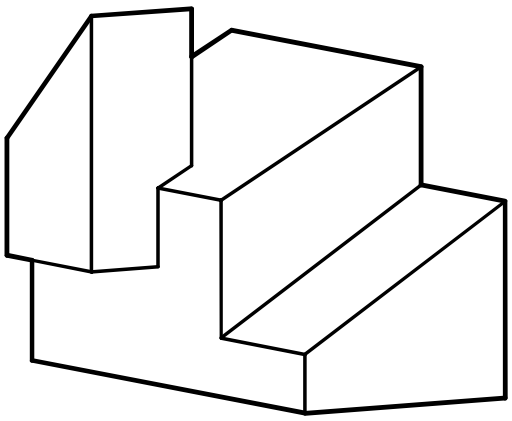
Fig. 2

3. Fig. 3 shows the plan and elevation of a building. A pictorial view of the building is also shown.

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.

Note: Leave 18m between the plan and elevation as indicated.

Scale 1 : 200



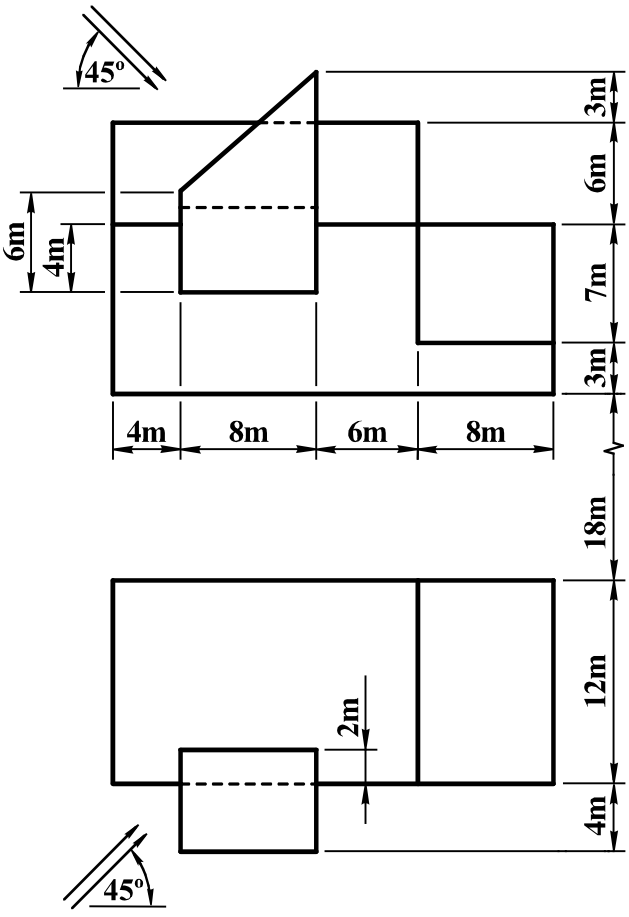
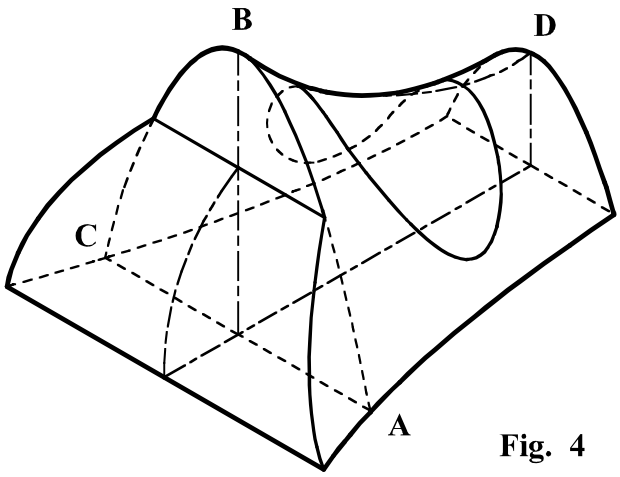


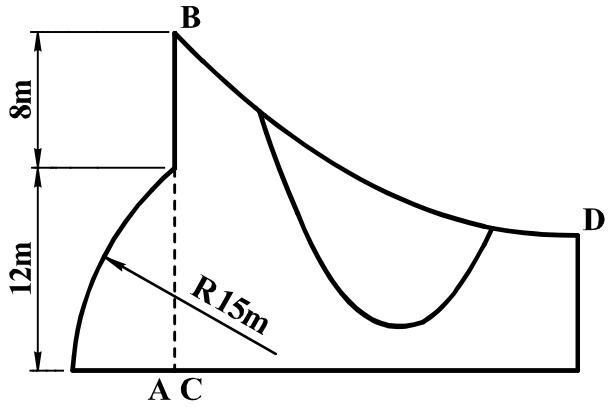
Fig. 3

4. A pictorial sketch of an arena is shown in Fig. 4. The outline plan and elevation of the arena are also shown. The main surface of the structure is generated by translating the parabola ABC in a vertical position along the parabola BD. D is the vertex of parabola BD. The arena includes a glazed area which is circular in plan.

Draw the given plan and elevation of the arena.

Scale 1 : 200





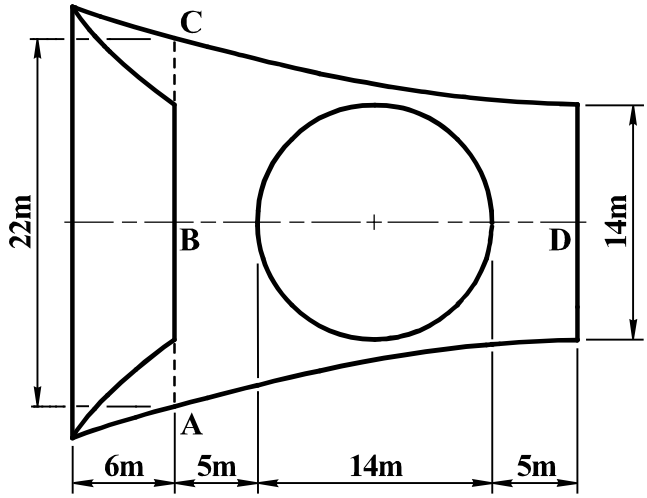


Fig. 4

5. **(a)** On a contour map, A and B are two points with altitudes of 105m and 95m respectively. On the map, A is located 65m north of B. A skew bore-hole at A is drilled in a south-westerly direction in plan and has an actual inclination of 40° to the horizontal plane. It reveals the top and bottom surfaces of a stratum at altitudes of 85m and 15m, 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 65m and 35m, respectively.

Determine the dip, strike and thickness of the stratum.

(b) On a separate map, R and S are two points on the upper surface of a stratum which are joined with a straight line. R has an altitude of 60m. On the map, S is located 90m north-east of R. The stratum has a strike of north 70° east and has a dip of 40° in a general south-easterly direction.

Find the altitude of point S and determine the true angle between the line RS and the strike line.

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 and ADCEF is a regular pentagon in plan. The roof is formed by extending the adjoining hyperbolic paraboloid surfaces ABCD and ABEF.

(a) Draw the plan and elevation of the roof.

(b) Show the curvature of the roof along a line joining C and F.

(c) A plane director for the elements AD and BC is positioned so that it contains point A. Draw the traces for this plane director, determine the true angle between the plane director and the vertical plane and find the shortest distance from the point F to the plane director.

Scale 1 : 200

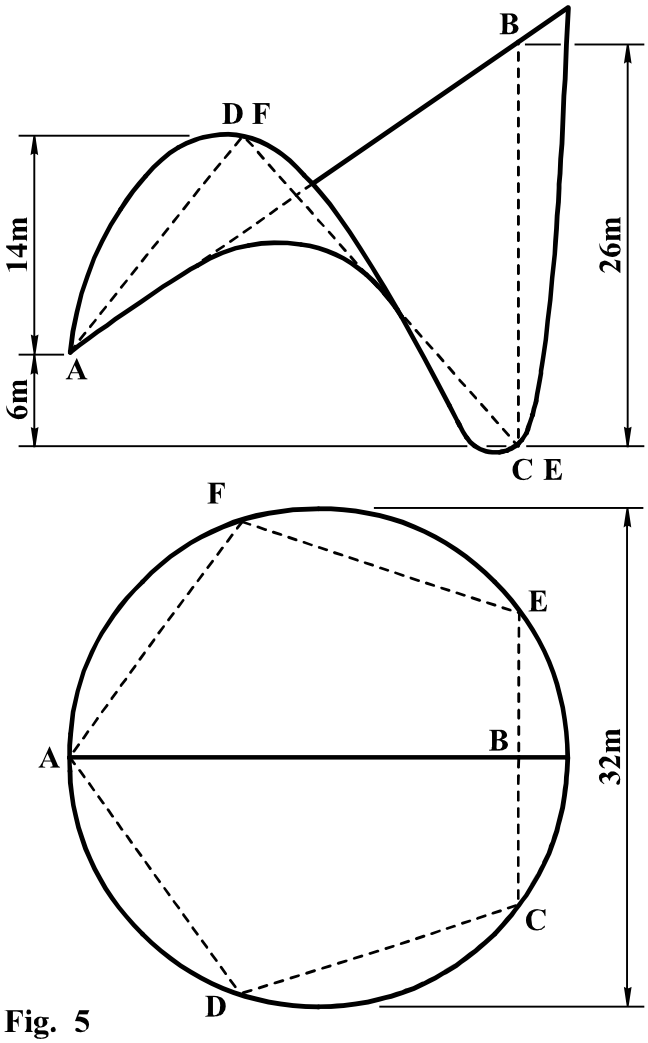


Fig. 5

7. The accompanying drawing shows ground contours at five-metre vertical intervals. ABCD is the line of a proposed roadway. O is the centre of the circular arc.

The roadway has the following specification:-

(i) formation width is as shown;

(ii) formation level at B is 40m;

(iii) A to B is level;

(iv) gradient B to C rising uniformly, to a level of 55m at C;

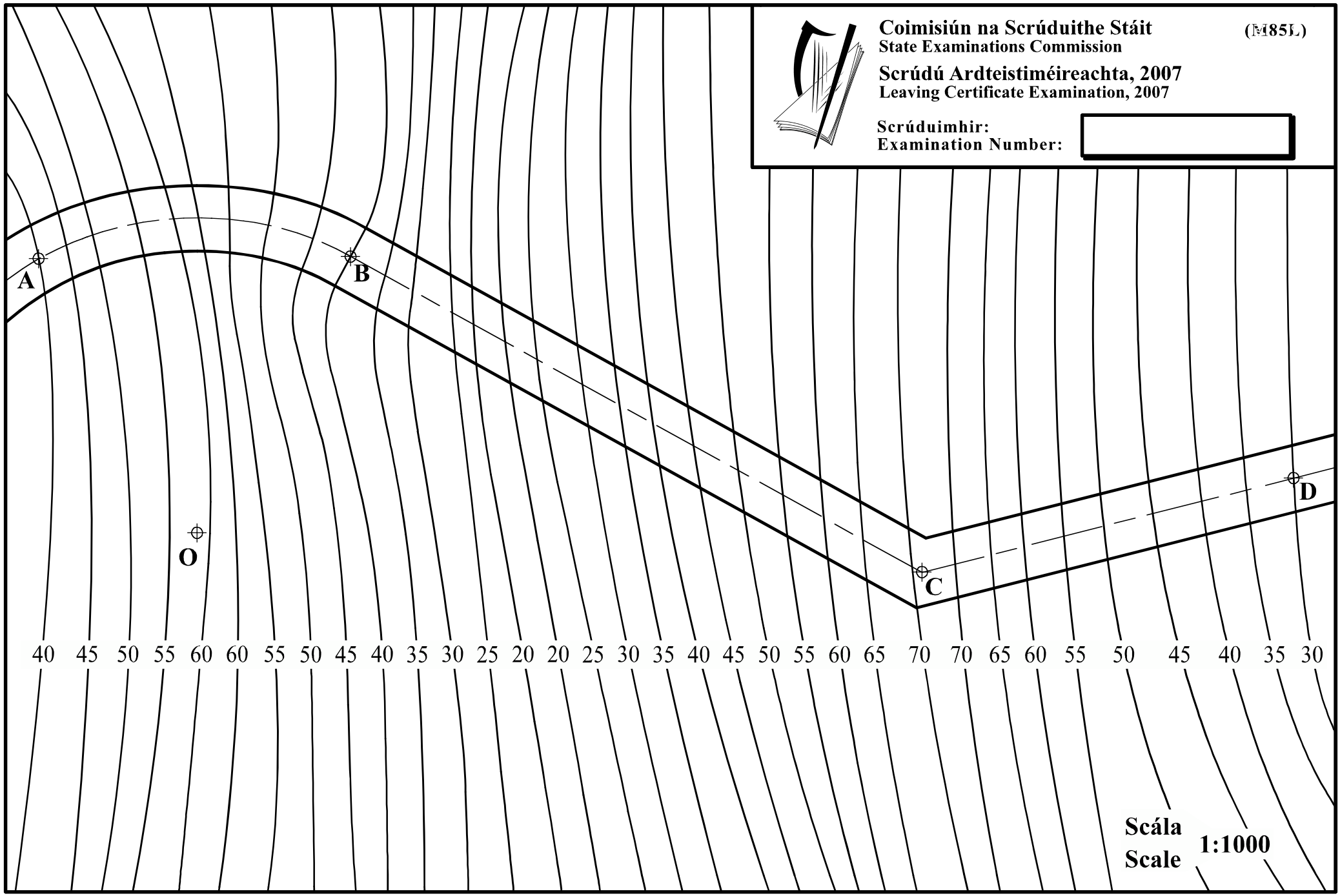
(v) gradient C to D, 1 in 15 falling;

(vi) side slope for cuttings is 1 in 1·5;

(vii) side slope for embankments is 1 in 2.

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

(b) Determine, using a graphic method, the gradient of the roadway between B and C.


Coimisiún na Scrúduithe Stáit
State Examinations Commission
(M85L)
Scrúdú Ardteistiméireachta, 2007
Leaving Certificate Examination, 2007
Scrúduimhir:
Examination Number:
A
B
C
D
O
40 45 50 55 60 60 55 50 45 40 35 30 25 20 20 25 30 35 40 45 50 55 60 65 70 70 65 60 55 50 45 40 35 30
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Scale
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