AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA

M.85

LEAVING CERTIFICATE EXAMINATION, 2000

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TECHNICAL DRAWING - HIGHER LEVEL

PAPER II(B) - BUILDING APPLICATIONS

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FRIDAY, 16 JUNE - AFTERNOON 2.00 P.M. TO 5.00 P.M.

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(200 Marks)

INSTRUCTIONS

(a) Answer <u>four</u> 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 9 m from the corner A and the horizon line is 9 m above the ground line.

Use auxiliary vanishing points where appropriate.
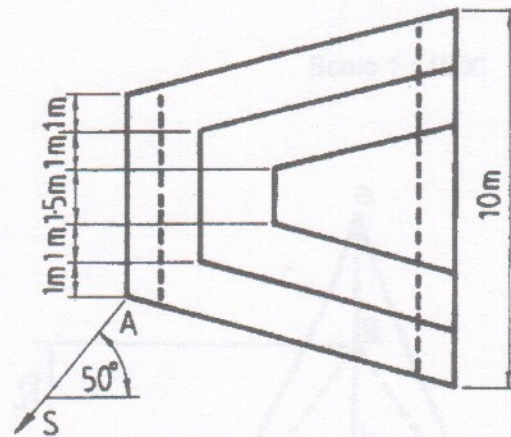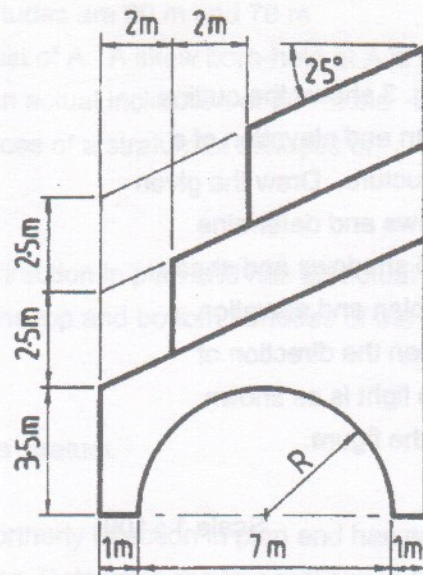
Scale 1 : 100

Fig. 1

2. Fig. 2 shows the outline plan and elevation of roof surfaces and a dormer window. Surface A has a pitch of 50° and surface B has a pitch of 45° The line of intersection between surfaces A and D has a true inclination of 35° to the horizontal plane. Surfaces E and G have a pitch of 50° and surface F has a pitch of 15°. The dihedral angle between the surfaces C and D is 100°

   (a) Draw the given plan and elevation.

   (b) Determine the dihedral angle between the surfaces A and B.
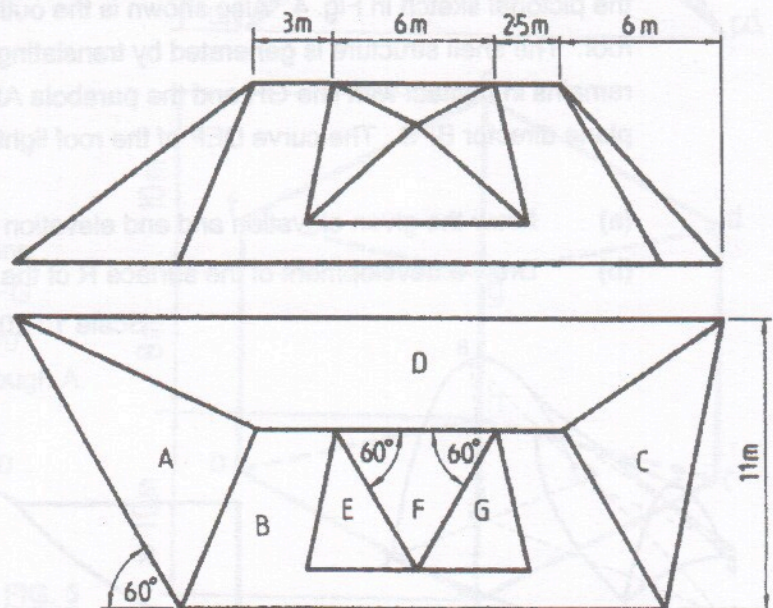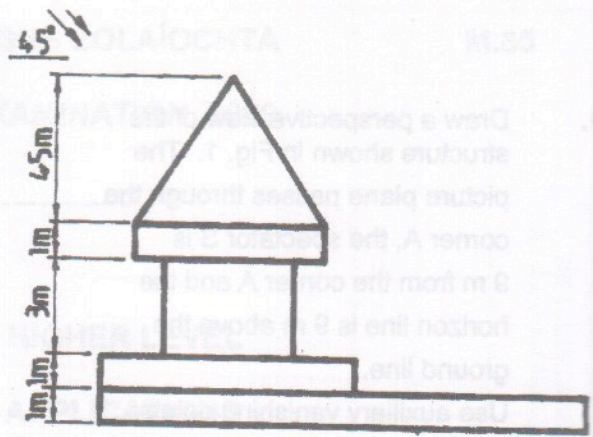
Scale 1 : 100

FIG. 2

3. Fig. 3 shows the outline plan and elevation of a structure. Draw the given views and determine the shadows and shade in plan and elevation when the direction of the light is as shown in the figure.
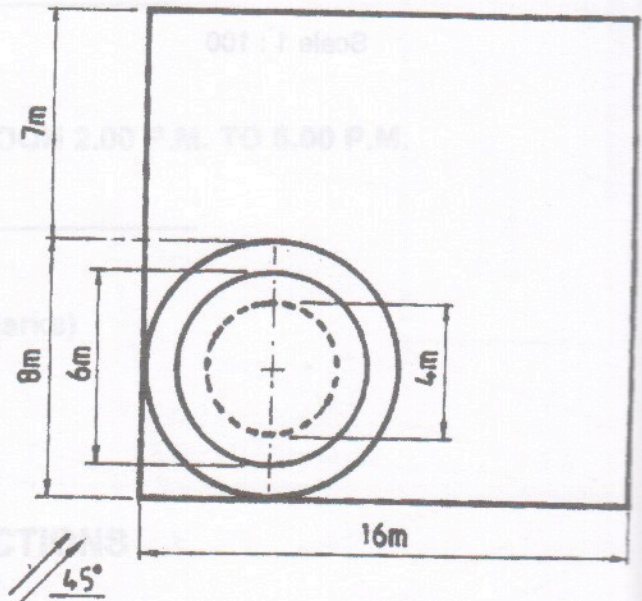
Scale 1 : 100

45m

1m

3m

1m,1m

7m

8m

6m

4m

16m

45°

FIG. 3

4. A roof system in the form of a shell structure which incorporates a roof light is shown in the pictorial sketch in Fig. 4. Also shown is the outline elevation and end elevation of the roof. The shell structure is generated by translating a straight line, such as BP, which remains in contact with line GH and the parabola ABC and which is always parallel to the plane director BPS. The curve DEF of the roof light is a parabola.

   (a) Draw the given elevation and end elevation and project a plan.

   (b) Draw a development of the surface R of the roof-light.

Scale 1 : 200

R

5m   21m

B

E

5m

13m

D   F

GA   4m   12m   4m   CH

FIG. 4

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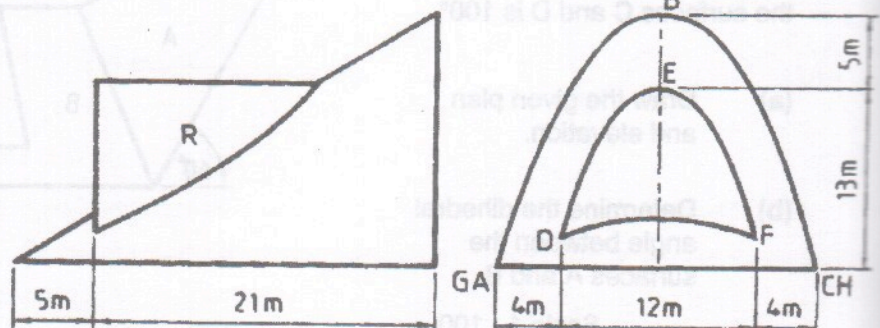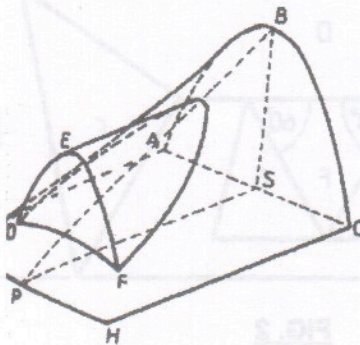
5. On a contour map A and B are two points whose altitudes are 90 m and 70 m respectively. On the map B is located 90 m north-east of A. A skew bore-hole at A is drilled in a north-westerly direction in plan and has an actual inclination of 60° to the horizontal plane. It reveals the top and bottom surfaces of a stratum at altitudes of 50 m and 20 m, respectively.

A skew bore-hole at B is drilled in a south-westerly direction in plan and has an actual inclination of 50° to the horizontal plane. It reveals the top and bottom surfaces of the stratum at altitudes of 60 m and 45 m, respectively.

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

(b) Another skew bore-hole at A is drilled in a northerly direction in plan and has an actual inclination of 65° to the horizontal plane. Determine the true inclination of this bore-hole to the stratum.

Scale 1 : 1000

6. Fig. 5 shows the outline plan and elevation of a roof. The hyperbolic paraboloid surfaces ABEF and BCDE are extensions of the smaller hyperbolic paraboloid surfaces AHGF and CDGH, respectively. The roof perimeter is a regular hexagon in plan.

(a) Draw the given plan and elevation and project an end elevation.

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

(c) Determine the traces of the plane director for the edges AH and FG of the surface AHGF and having its horizontal trace passing through A.
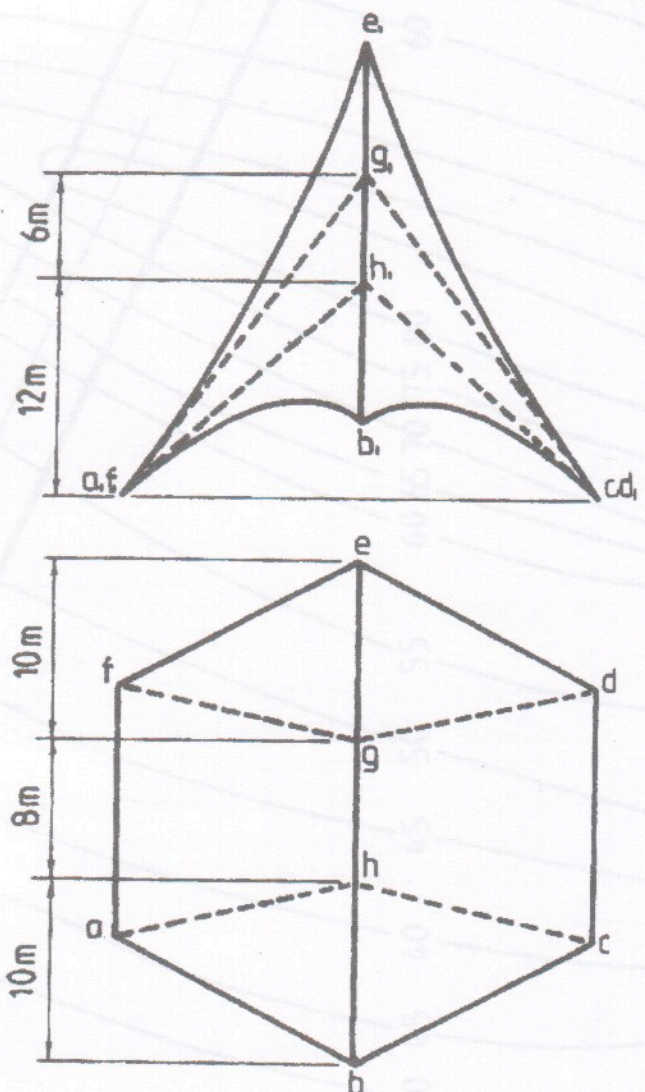
Scale 1 : 200

FIG. 5

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7. The accompanying drawing shows ground contours at five-metre vertical intervals. ABCD is the line of a proposed roadway. The roadway has the following specifications:-

    (i)   formation width from A to C is 15 m; from C to D the road is widened as shown;

    (ii)   formation level at B is 55 m;

    (iii)   gradient A to B is 1 in 10 rising; gradient B to D is 1 in 15 rising;

    (iv)   side slopes for cuttings 1 in 2;

    (v)   side slopes for embankments 1 in 1.5.

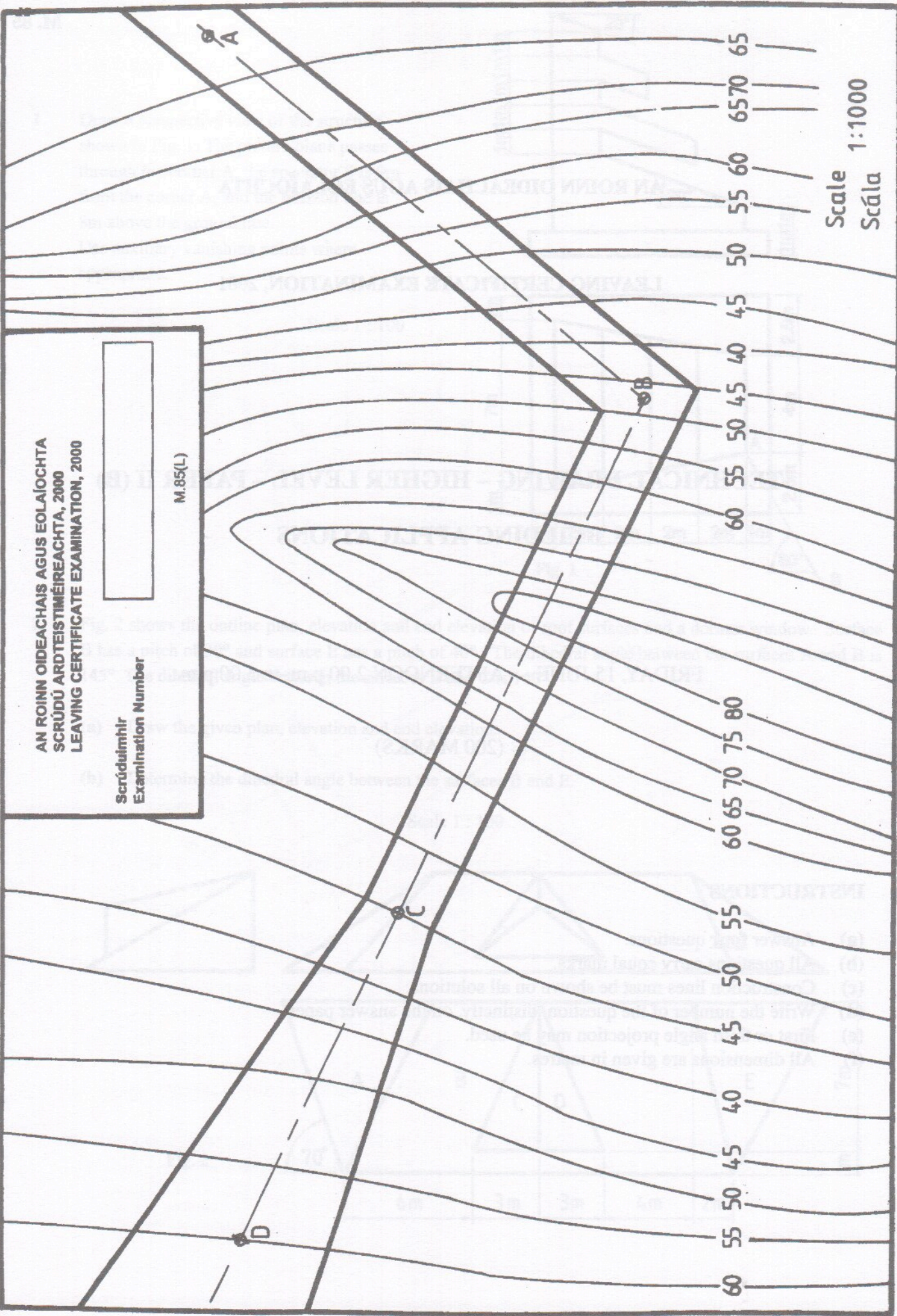On the drawing supplied, show the earthworks necessary to accommodate the roadway.
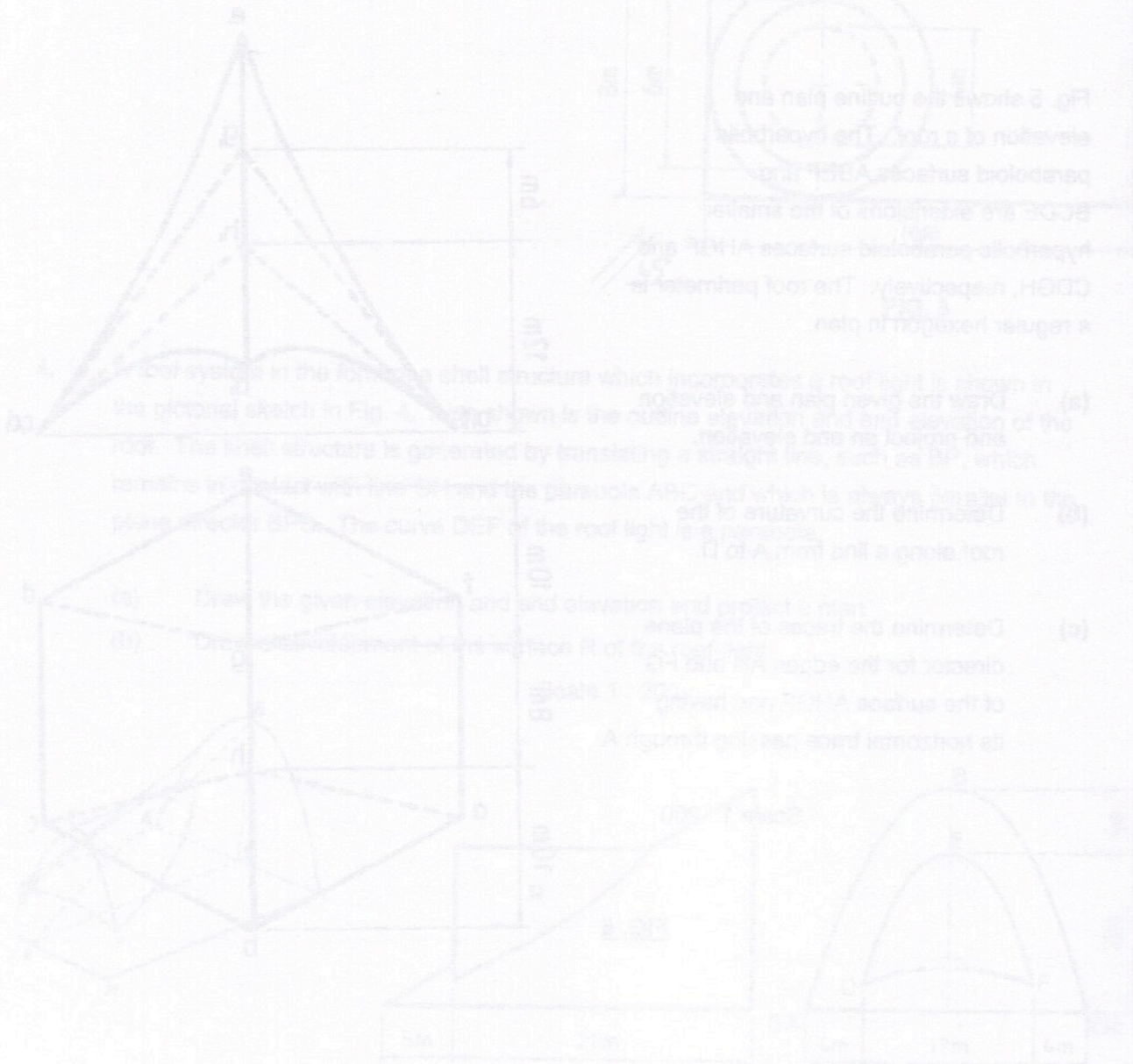
AN ROINN OIDEACHAIS AGUS EOLAÍOCHTA
SCRÚDÚ ARDTEISTIMÉIREACHTA, 2000
LEAVING CERTIFICATE EXAMINATION, 2000

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Examination Number

Scale 1:1000
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