LEAVING CERTIFICATE EXAMINATION, 1989

TECHNICAL DRAWING - HIGHER LEVEL - PAPER II (B)

BUILDING APPLICATIONS

THURSDAY, 22 JUNE, - MORNING 9.30 to 12.30

(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 number of the questions, distinctly, on the answer paper.
(e) First or third angle projection may be used.
(f) All measurements are given in metres or millimetres.

1. Fig. 1 shows the outline plan and elevation of a monument.
   (a) Draw the given plan.
   (b) Draw a perspective view of the monument when the position of the spectator is 5 m from the corner A, the picture plane passing through the corner A and the horizon line 3 m above the ground line. Use auxiliary vanishing points where appropriate.

Scale 1 : 50

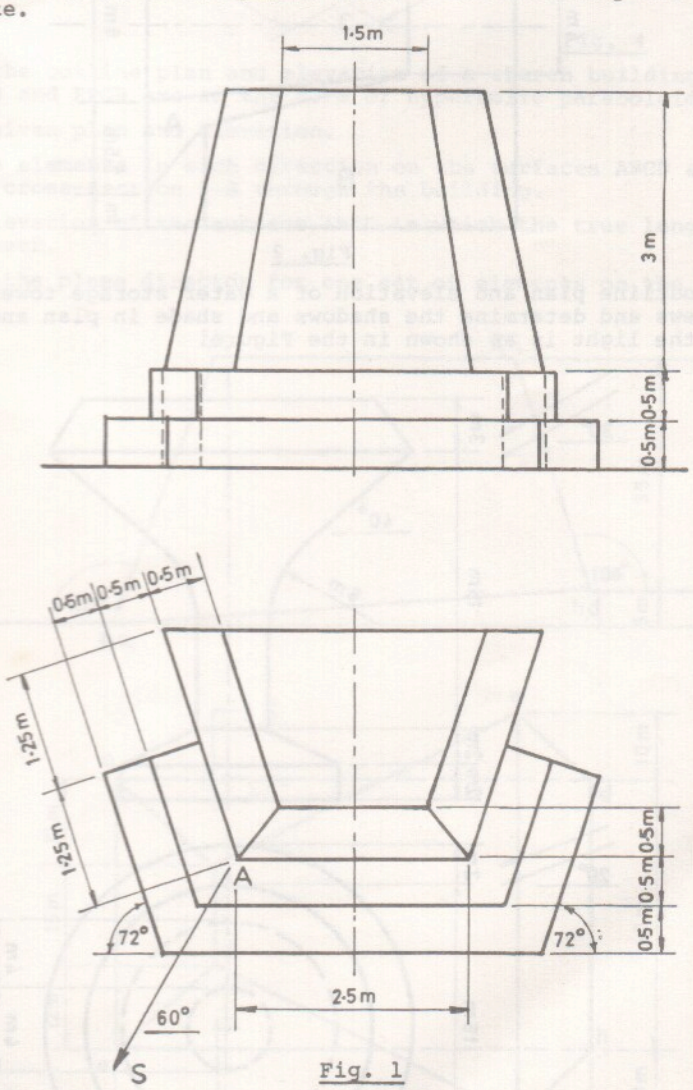



Fig. 1

2. Fig. 2 shows the outline plan and elevation of a roof with two surfaces having pitches of 70° and 30°, respectively. The roof also incorporates a dormer window, as shown.

(a) Draw the given plan and elevation.

(b) Determine the true shape of the dormer surface A.

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

Scale 1 : 200

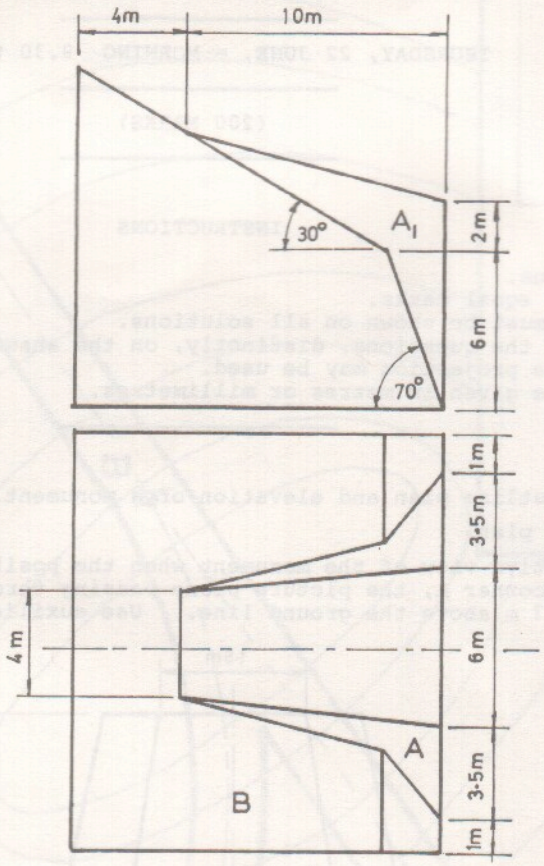



Fig. 2

3. Fig. 3 shows the outline plan and elevation of a water storage tower.
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 : 200

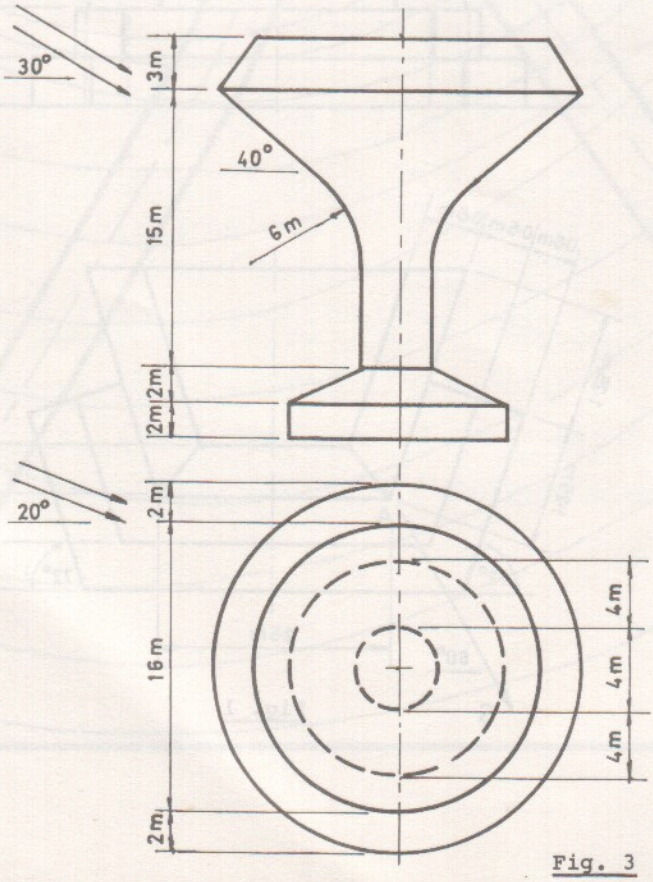



Fig. 3

4. Fig. 4 shows a sketch of a shell structure unit.
The curves CF and AD are hyperbolae with DF as the transverse axis.
The surface of the unit is generated by translating the parabola ABC in a vertical position along the curve BE.

(a) Draw the parabola DEF and hence determine the true shape of the parabola ABC.

(b) Draw the plan, elevation and end view of the unit.

Scale 1 : 200

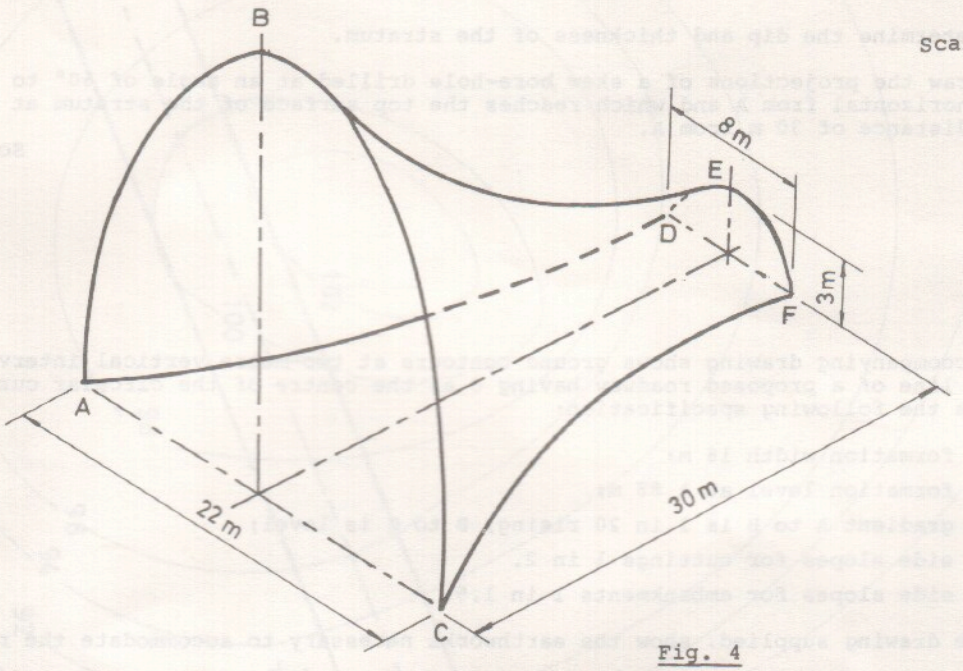



Fig. 4

5. Fig. 5 shows the outline plan and elevation of a church building.
The walls ABCD and EFGH are in the form of hyperbolic paraboloids.

(a) Draw the given plan and elevation.

(b) Using five elements in each direction on the surfaces ABCD and EFGH, draw the vertical cross-section S-S through the building.

(c) Draw an elevation of the surface ABCD in which the true length of the element AB will be seen.

(d) Determine the plane director for one set of elements on the surface ABCD.

Scale 1 : 500

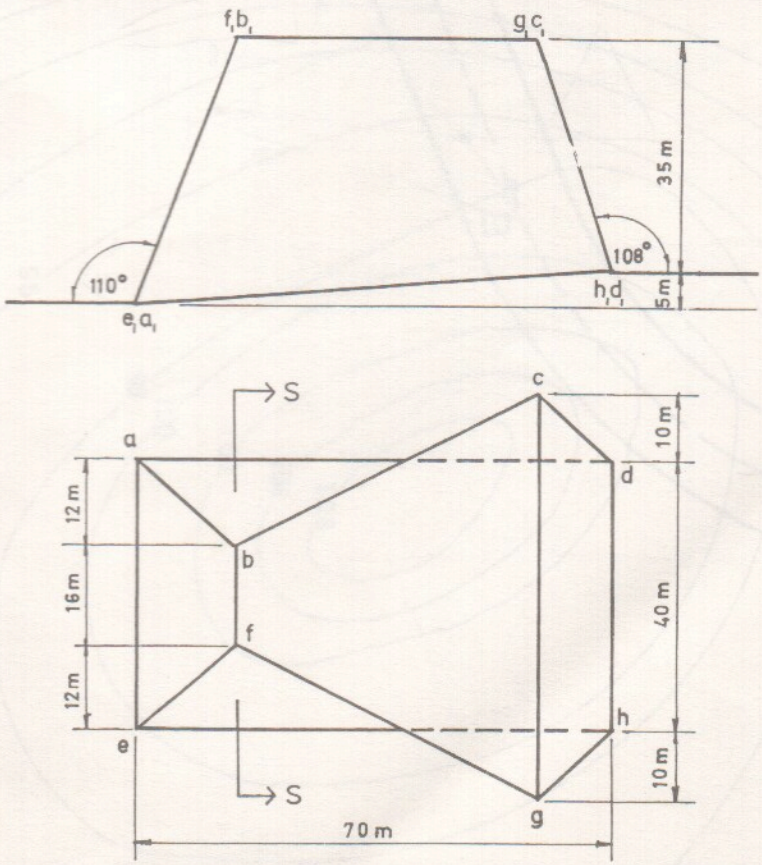



Fig. 5

6. On a contour map A and B are two points whose altitudes are 100 m. B is located 110 m south-east of A.

A skew bore-hole at A is drilled in a south-westerly direction in plan and is inclined at 70° to the horizontal in elevation. It reveals the top and bottom surfaces of a stratum at altitudes of 70 m and 20 m respectively.

A skew bore-hole at B is drilled in a north-easterly direction in plan and is inclined at 60° to the horizontal in elevation. It reveals the top and bottom surfaces of the stratum at altitudes of 90 m and 70 m, respectively.

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

(b) Draw the projections of a skew bore-hole drilled at an angle of 60° to the horizontal from A and which reaches the top surface of the stratum at a distance of 30 m from A.

Scale 1 : 1000

7. The accompanying drawing shows ground contours at two-metre vertical intervals. ABC is the line of a proposed roadway having O as the centre of the circular curve. The roadway has the following specification:

(i) formation width 16 m;

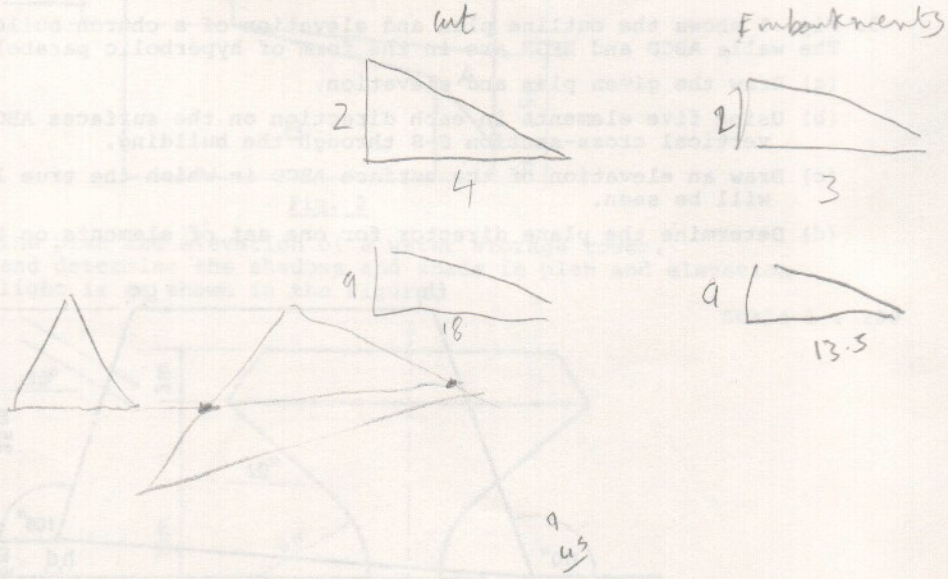
(ii) formation level at A 88 m;

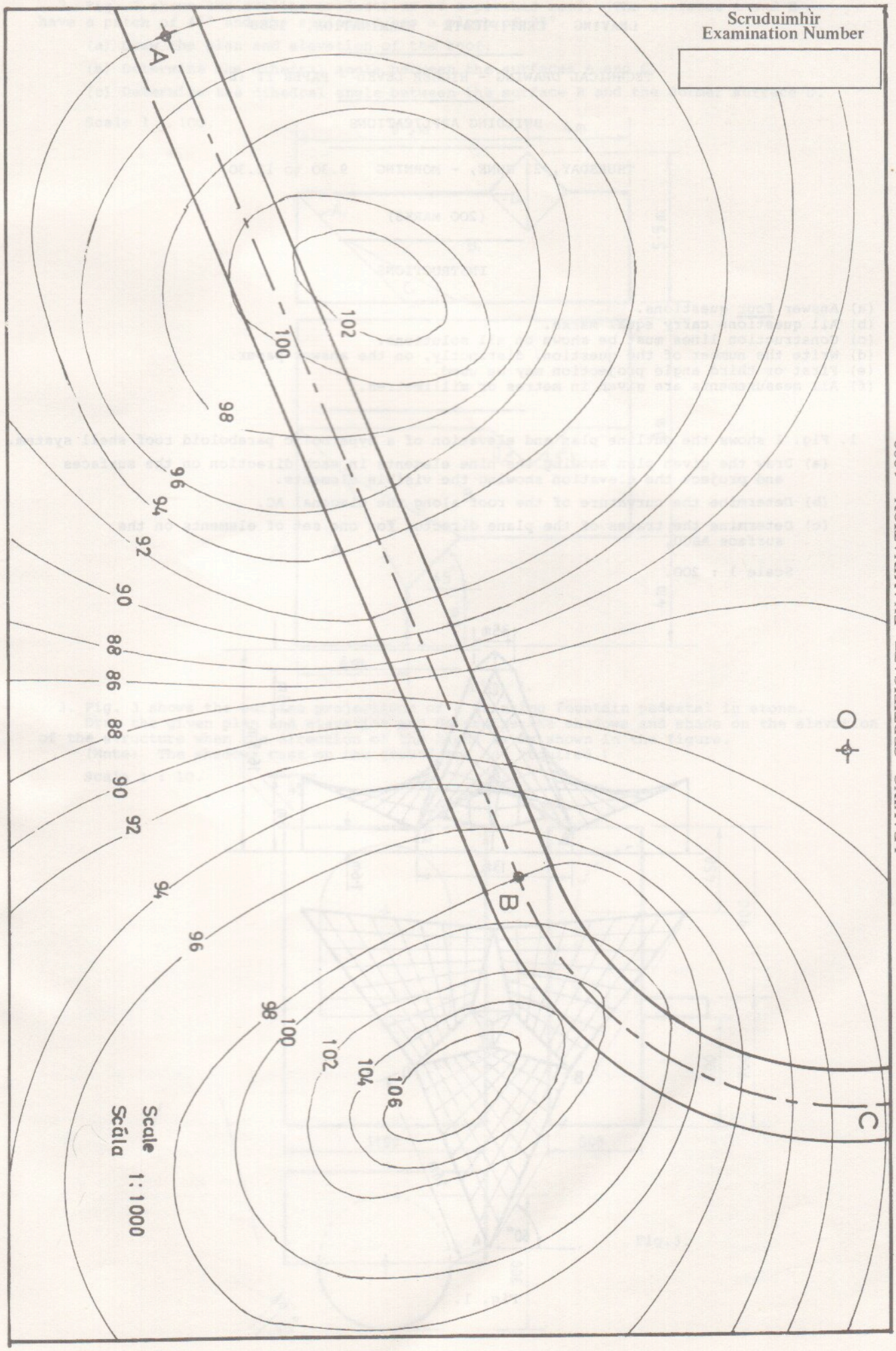
(iii) gradient A to B is 1 in 20 rising, B to C is level;

(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.



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