

TECHNICAL DRAWING - HIGHER LEVEL  
PAPER II(B) - BUILDING APPLICATIONS

MONDAY, 20 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 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 7m from the corner A and the horizon line is 8m above the ground line. Use auxiliary vanishing points where appropriate.

Scale 1 : 100

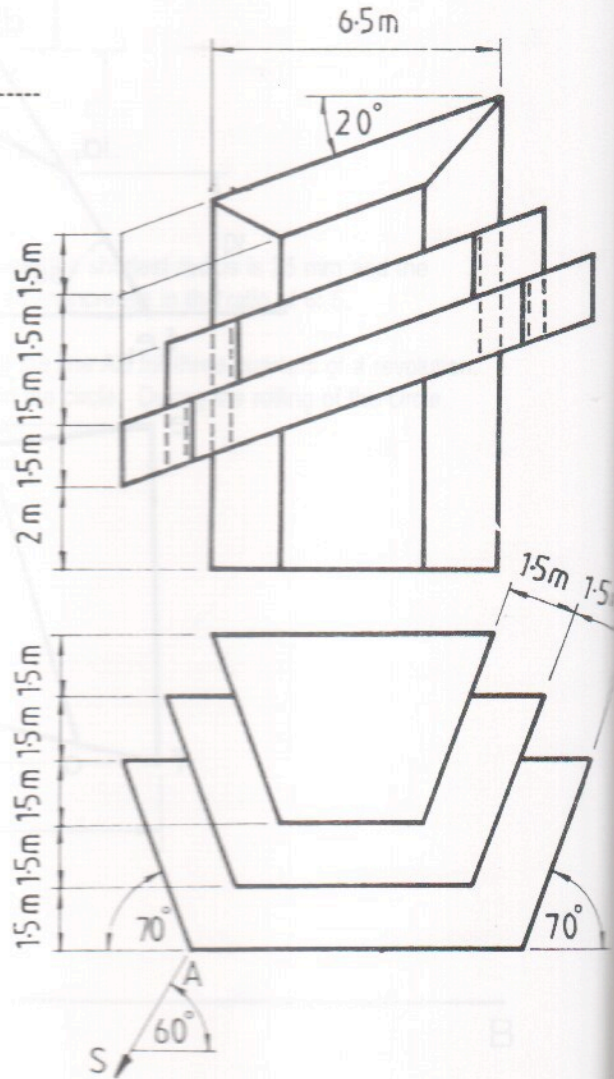


Fig. 1



2. Fig 2 shows the plan of a pitched roof. The surfaces A, C and D have pitches of  $45^\circ$ ,  $35^\circ$  and  $55^\circ$ , respectively. The top surface E is horizontal. The line of intersection between the surfaces B and C has a true inclination of  $25^\circ$  to the horizontal plane and the dihedral angle between the surfaces B and C is  $125^\circ$ .

Draw the given plan, project an elevation and determine the dihedral angle between the surfaces A and D.

Scale 1 : 100

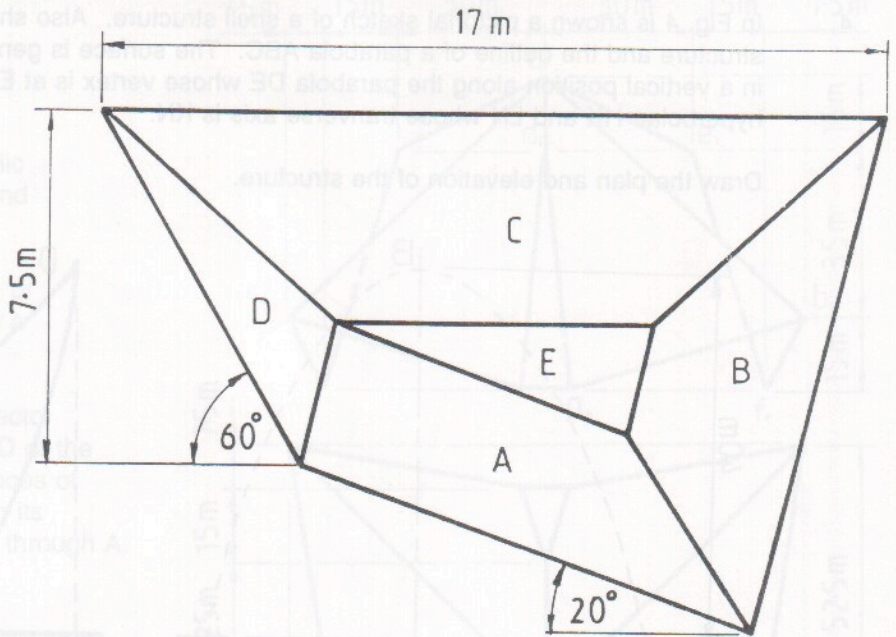


Fig. 2.

3. Fig. 3 shows the outline plan and elevation of a building.

Draw the given views and determine the shadows cast in plan and elevation when the direction of light is as shown in the figure.

Scale 1 : 200

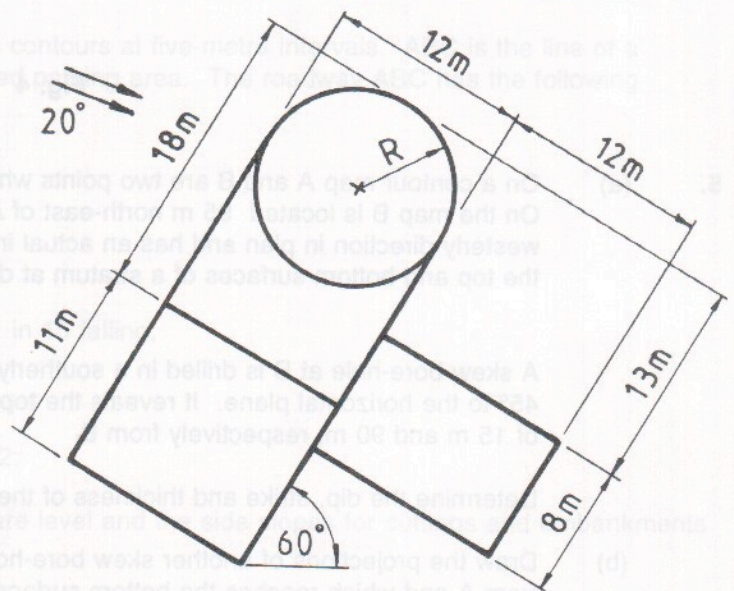
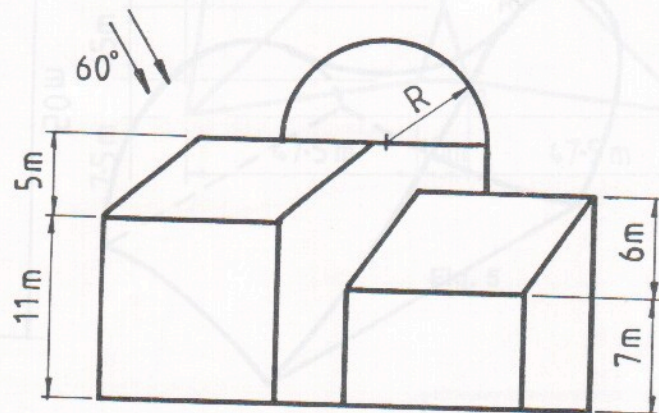


Fig. 3



4. In Fig. 4 is shown a pictorial sketch of a shell structure. Also shown are the plan and elevation of the structure and the outline of a parabola ABC. The surface is generated by translating the parabola ABC in a vertical position along the parabola DE whose vertex is at E and terminating at ground level in the hyperbolae HK and LN whose transverse axis is KN.

Draw the plan and elevation of the structure.

Scale 1 : 500

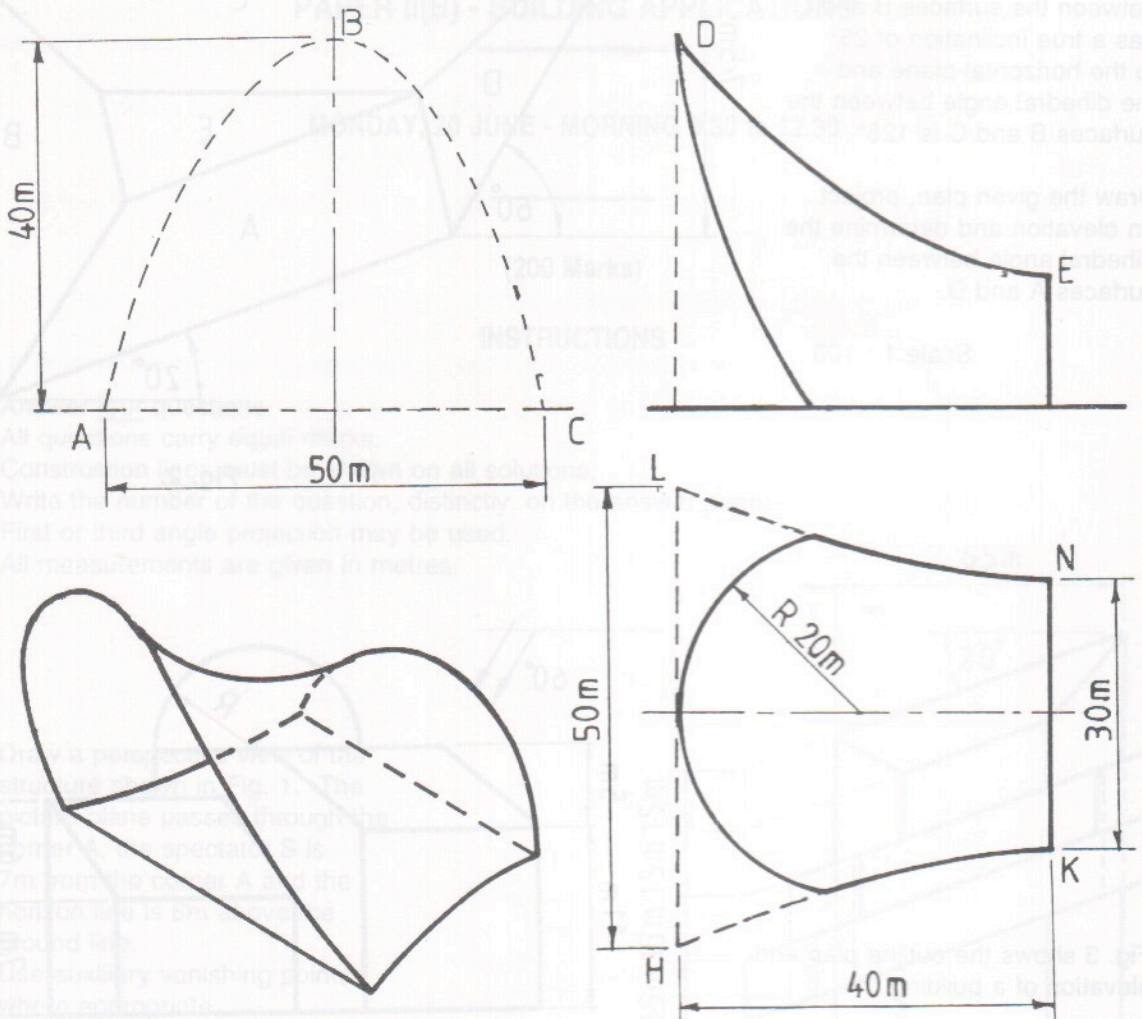


Fig. 4

5. (a) On a contour map A and B are two points whose altitudes are 110 m and 90 m, respectively. On the map B is located 95 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  $65^\circ$  to the horizontal plane. It reveals the top and bottom surfaces of a stratum at distances of 50 m and 75 m, respectively from A.

A skew bore-hole at B is drilled in a southerly direction in plan and has an actual inclination of  $45^\circ$  to the horizontal plane. It reveals the top and bottom surfaces of the stratum at distances of 15 m and 90 m, respectively from B.

Determine the dip, strike and thickness of the stratum.

- (b) Draw the projections of another skew bore-hole drilled at an angle of  $70^\circ$  to the horizontal plane from A and which reaches the bottom surface of the stratum at a distance of 100 m from A.

Scale 1 : 1000



6. Fig. 5 shows the outline plan and elevation of a roof which contains eight hyperbolic paraboloid surfaces.
- Draw the given hyperbolic paraboloid surfaces R and S in plan and elevation.
  - Determine the curvature of the roof surface S along a line joining B to E.
  - Determine the plane director for the edges AB and CD of the surface R. Show the traces of the plane director having its horizontal trace passing through A.

Scale 1 : 500

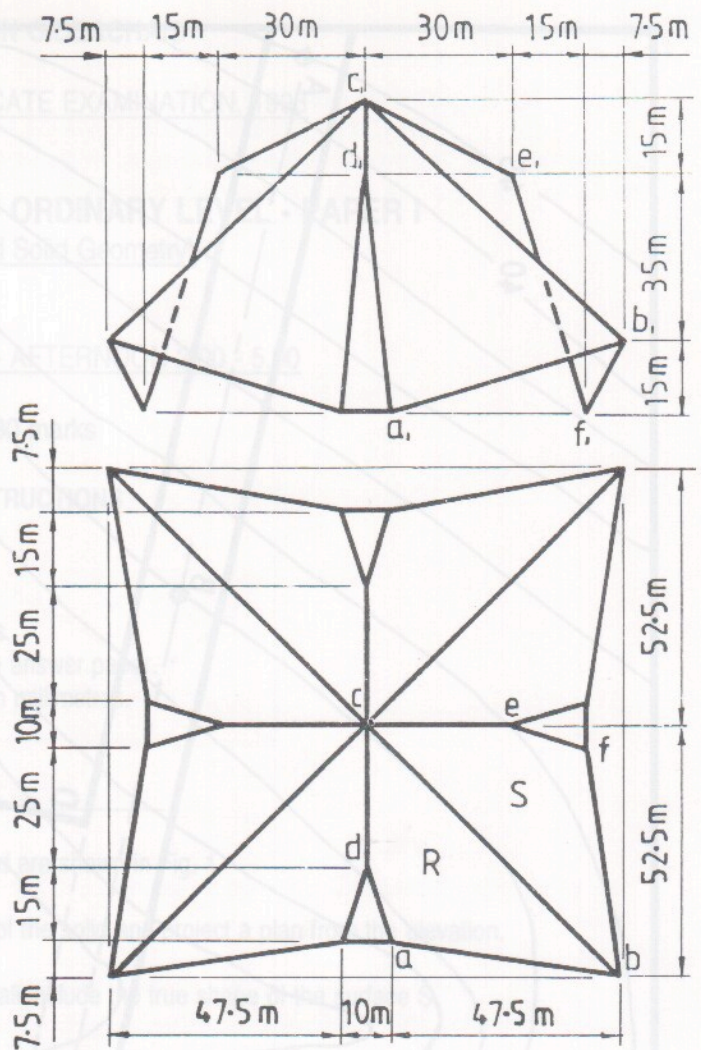


Fig. 5

7. The accompanying drawing shows ground contours at five-metre intervals. ABC is the line of a proposed roadway and DEFG is a proposed parking area. The roadway ABC has the following specifications:-

- formation width is 12 m;
- formation level at B is 40 m;
- A to B is level; gradient B to C is 1 in 15 falling;
- side slopes for cuttings 1 in 1.5;
- side slopes for embankments 1 in 2;

In the parking area the sides DE and GF are level and the side slopes for cuttings and embankments are the same as for the roadway ABC.

On the drawing supplied show the earthworks necessary to accommodate the roadway and parking area.



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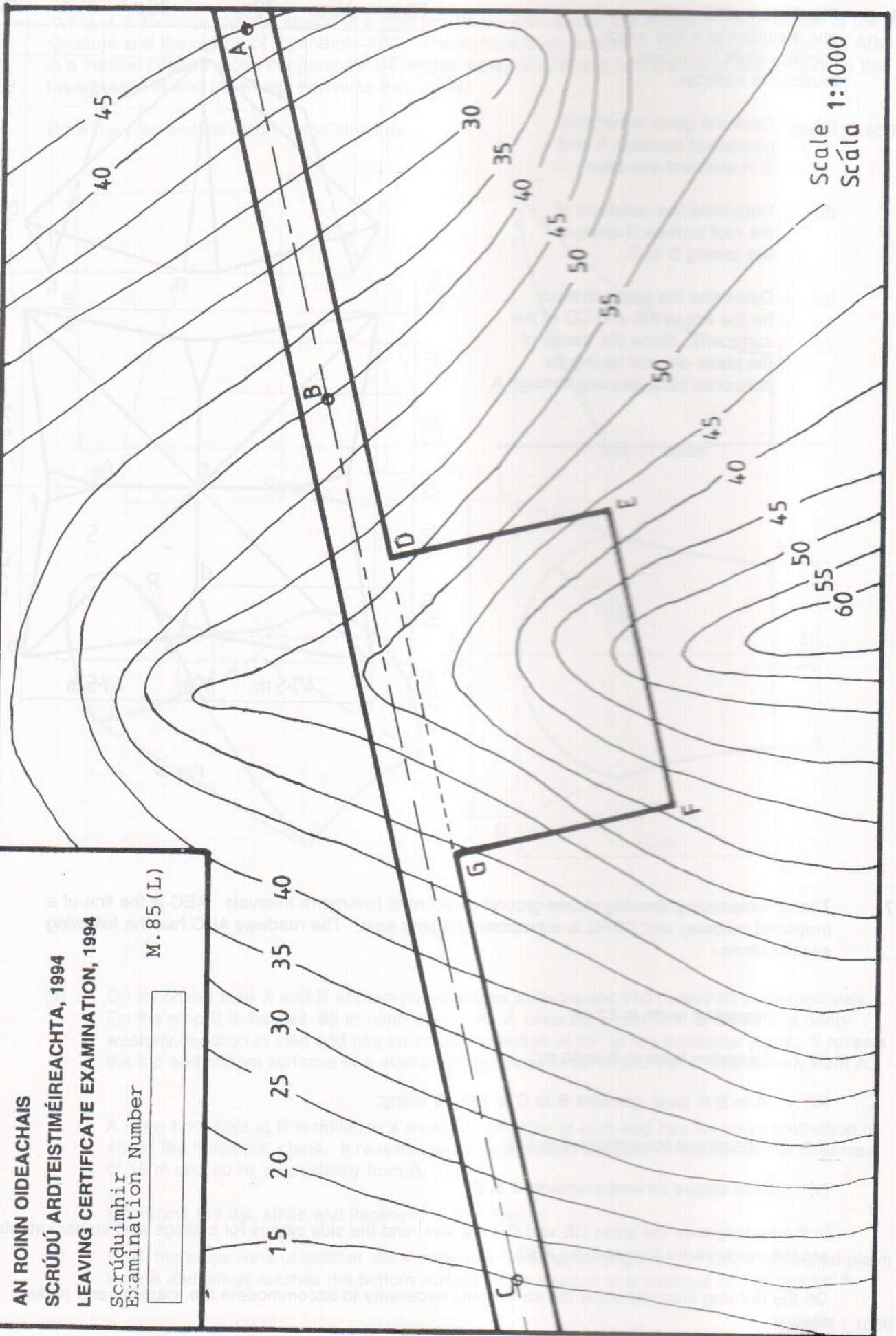
**SCRÚDÚ ARDTEISTIMÉIREACHTA, 1994**

**LEAVING CERTIFICATE EXAMINATION, 1994**

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