



Leaving Certificate Examination, 2003

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

(200 Marks)

Friday 13 June
Afternoon, 2.00 to 5.00

- (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) All dimensions on the question paper are given in metres or millimetres.*
- (f) 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 9m from the corner A and the horizon line 9m above the ground line.

Use auxiliary vanishing points where appropriate.

Scale 1 : 100

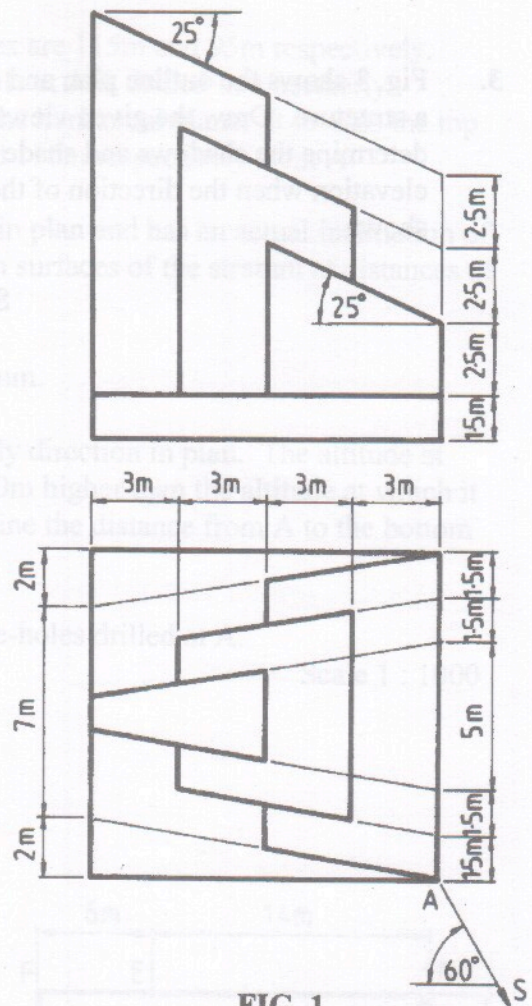


FIG. 1

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

Surface A has the same pitch as surface B and the dihedral angle between surfaces A and B is 130° . Surface C has a pitch of 25° and surface D has a pitch of 40° . The dihedral angle between surfaces D and E is 125° .

- (a) Draw the given plan and elevation.
 (b) Determine the dihedral angle between the surfaces B and C.

Scale 1 : 200

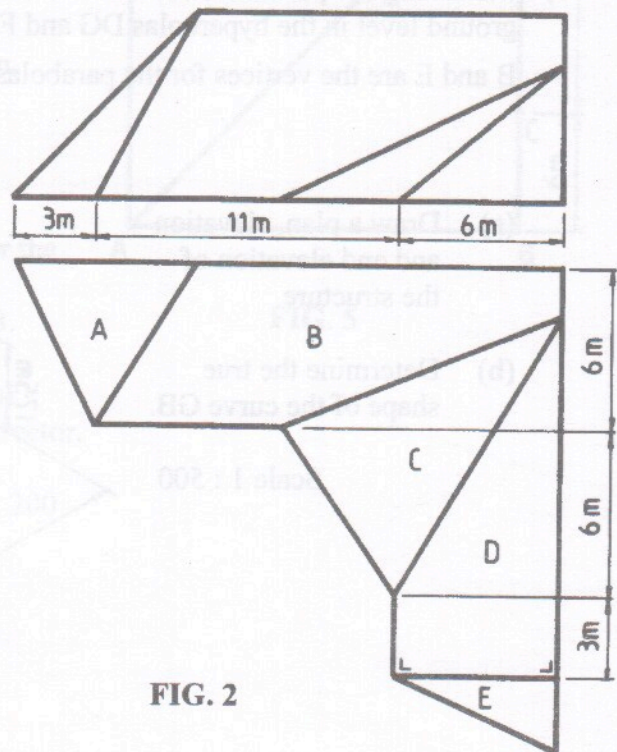


FIG. 2

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.

Scale 1 : 200

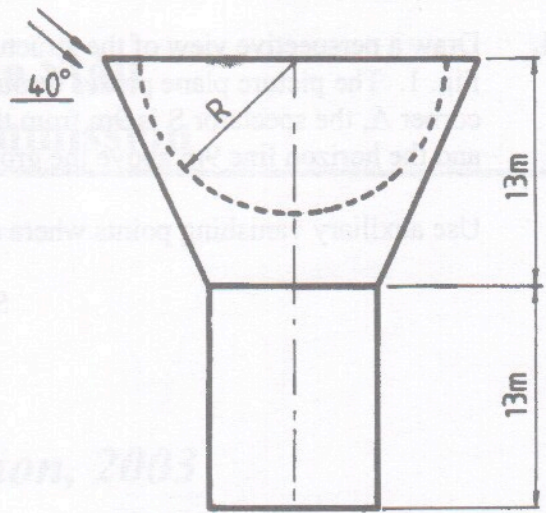
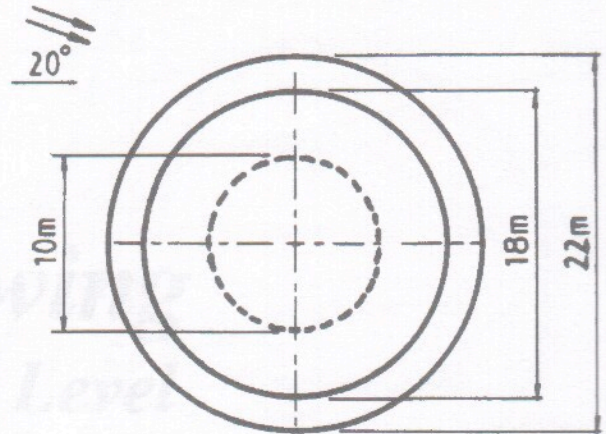


FIG. 3



4. Fig. 4 shows a pictorial view of a shell structure. The surface of the unit is generated by translating the parabola ABC in a vertical position along the parabola BE and terminating at ground level in the hyperbolas DG and FH with the transverse axis DF.

B and E are the vertices for the parabolas ABC and BE respectively.

- (a) Draw a plan, elevation and end elevation of the structure.
 (b) Determine the true shape of the curve GB.

Scale 1 : 500

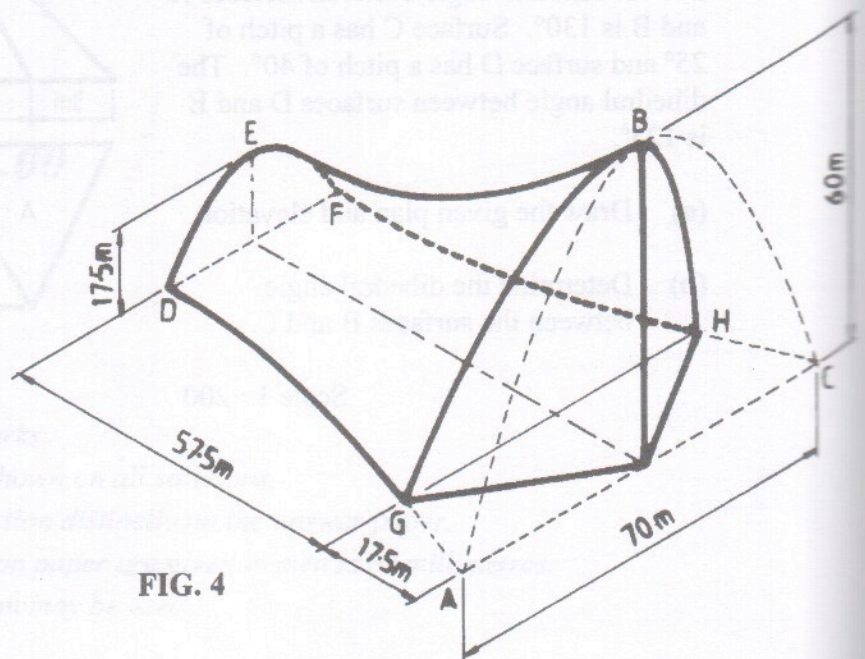


FIG. 4

5. On a contour map A and B are two points whose altitudes are 115m and 95m respectively. On the map B is located 80m east of A. A skew bore-hole at A is drilled in a northerly direction in plan and has an actual inclination of 65° to the horizontal plane. It reveals the top and bottom surfaces of a stratum at distances of 45m and 110m respectively from A.

A skew bore-hole at B is drilled in a southerly 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 distances of 50m and 70m respectively from B.

- Determine the dip, strike and thickness of the stratum.
- Another skew bore-hole at A is drilled in an easterly direction in plan. The altitude at which it reaches the top surface of the stratum is 50m higher than the altitude at which it reaches the bottom surface of the stratum. Determine the distance from A to the bottom surface of the stratum along the bore-hole.
- Determine also the true angle between the two bore-holes drilled at A.

Scale 1 : 1000

6. Fig. 5 shows the outline plan of two adjoining hyperbolic paraboloid roof surfaces ABCD and AFED. The roof perimeter is a square in plan.

The corners F and B are at ground level, corner A is 7m above ground level, corners C and E are 19m above ground level and corner D is 26m above ground level.

- Draw the given plan and project an elevation.
- Show the curvature of the roof along a line joining C and F.
- Determine the traces of the plane director for the edges BC and AD of the surface ABCD and having its horizontal trace passing through B.
- Determine the true angle between the vertical trace and the horizontal trace on the plane director.

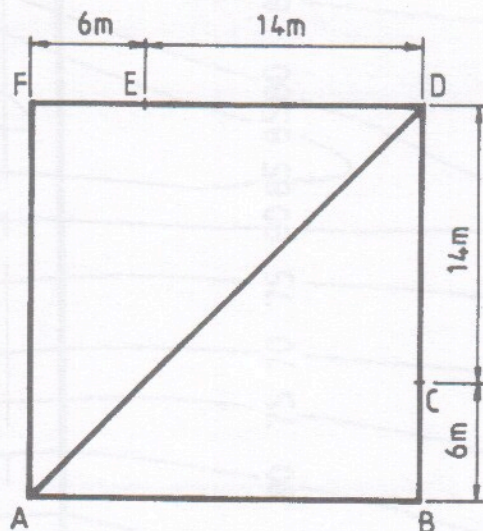


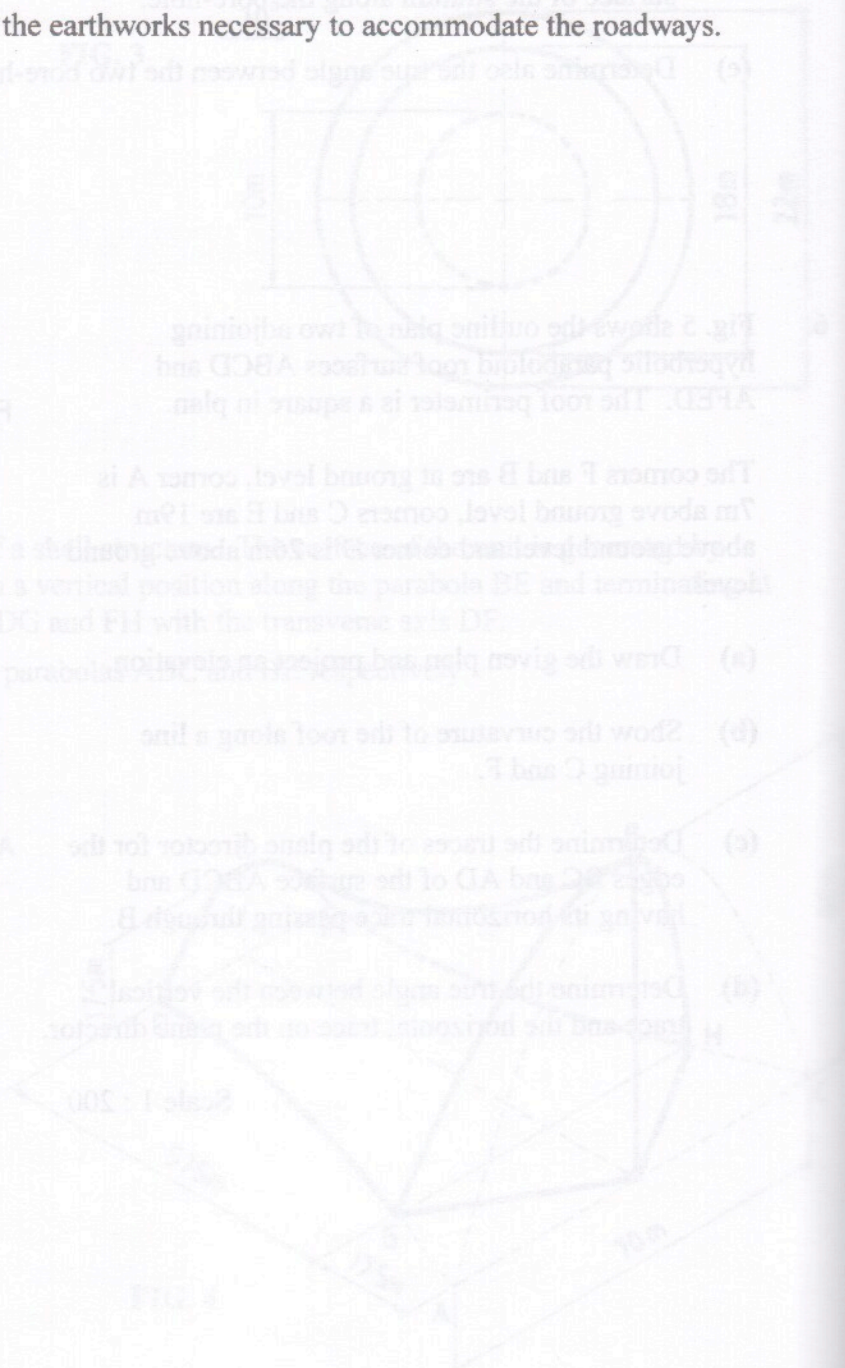
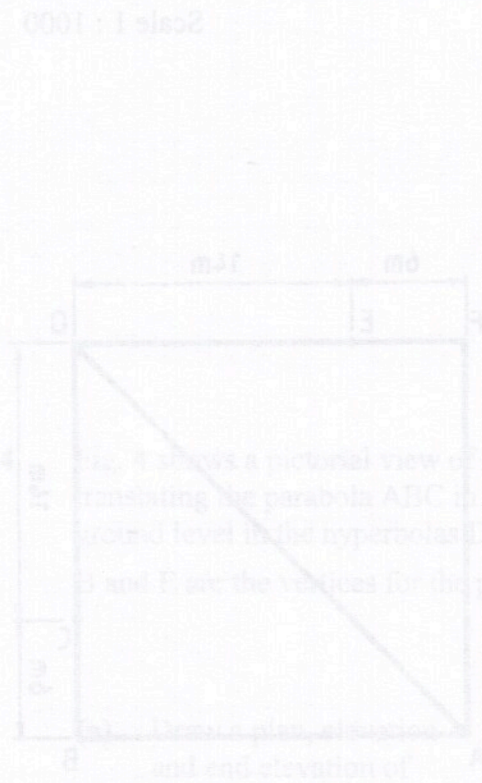
FIG. 5

Scale 1 : 200

7. The accompanying drawing shows ground contours at five-metre vertical intervals. AD and BE are the lines of proposed roadways. The roadways have the following specifications:-

- (i) formation width for both AD and BE is 15m;
- (ii) formation level at B is 90m;
- (iii) A to C is level;
- (iv) gradient C to D is 1 in 10 rising;
- (v) gradient B to E is 1 in 15 falling;
- (vi) side slopes for cuttings for roadway AD is 1 in 2;
- (vii) side slopes for cuttings for roadway BE is 1 in 1;
- (viii) side slopes for embankments for both roadways AD and BE is 1 in 1.5.

On the drawing supplied show the earthworks necessary to accommodate the roadways.





Coimisiún na Scrúduithe Stáit (M85L)
State Examinations Commission
Serú dú Ardteistiméireachta, 2003
Leaving Certificate Examination, 2003

Scrúduimhir:
Examination Number:

