LEAVING CERTIFICATE EXAMINATION, 1990

TECHNICAL DRAWING - HIGHER LEVEL - PAPER II (B)

BUILDING APPLICATIONS

THURSDAY, 21 JUNE - MORNING 9.30 to 12.30

(200 MARKS)

(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 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. Draw a perspective view of the structure shown in FIG. 1. The picture plane passes through the corner A, the spectator S is 6m from the corner A and the horizon line is 4m above the ground line. Use auxiliary vanishing points where appropriate.

    Scale 1 : 50.

FIG. I
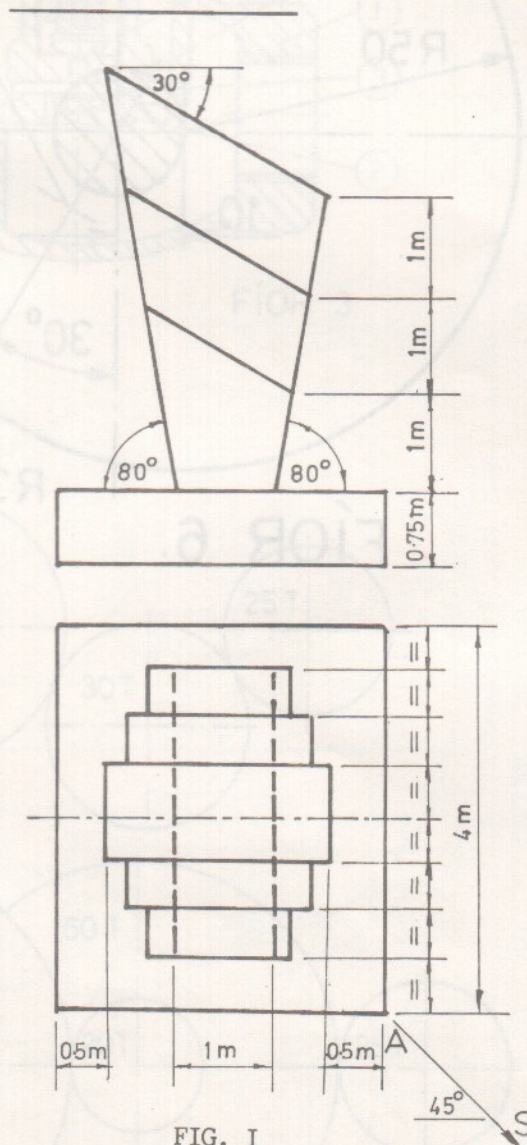
2. FIG. 2. shows the plan and elevation of a pitched roof. The surface A has a pitch of 35° and the surfaces B and D have a pitch of 50°. The dihedral angle between the surfaces B and C is 135°.

Draw the given plan and elevation and find the dihedral angle between the surfaces A and B.   Scale 1 : 100
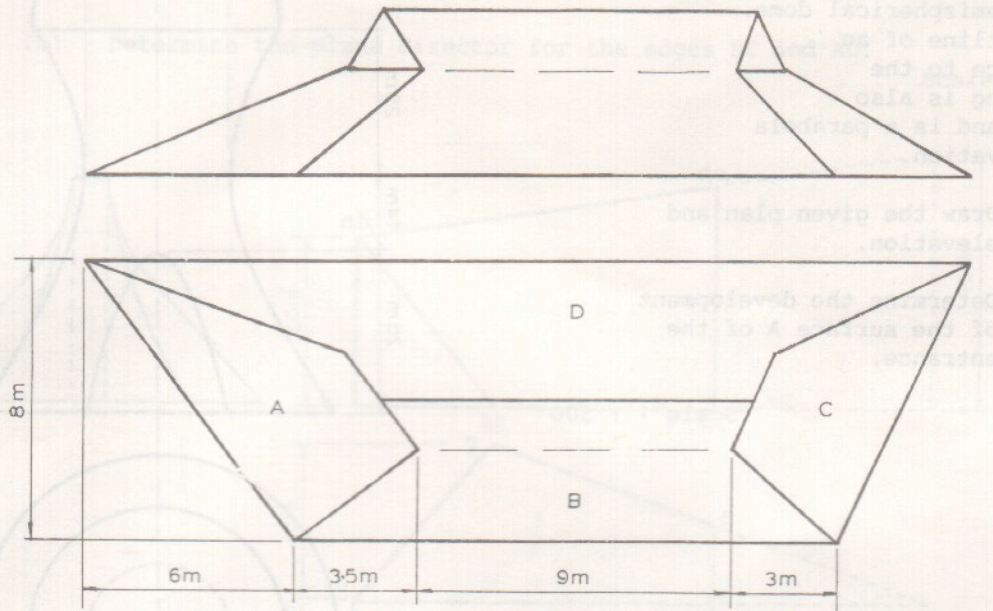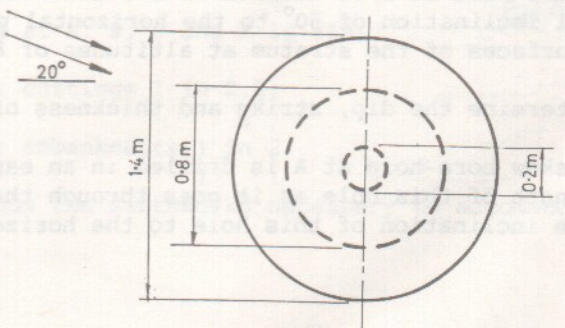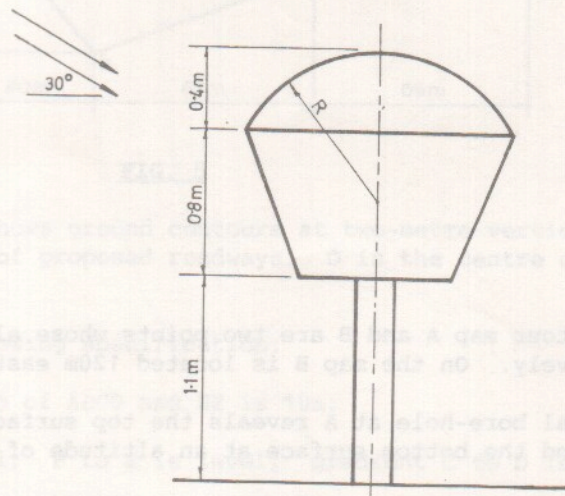

FIG 2

3. FIG. 3. shows the plan and elevation of a lamp standard. 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 : 20

FIG. 3

4. FIG. 4 shows the outline
    plan and elevation of
    an observatory building.
    It is in the form
    of a hyperboloid of
    revolution surmounted
    by a hemispherical dome.
    The outline of an
    entrance to the
    building is also
    shown and is a parabola
    in elevation.

    (a)   Draw the given plan and
          elevation.

    (b)   Determine the development
          of the surface A of the
          entrance.
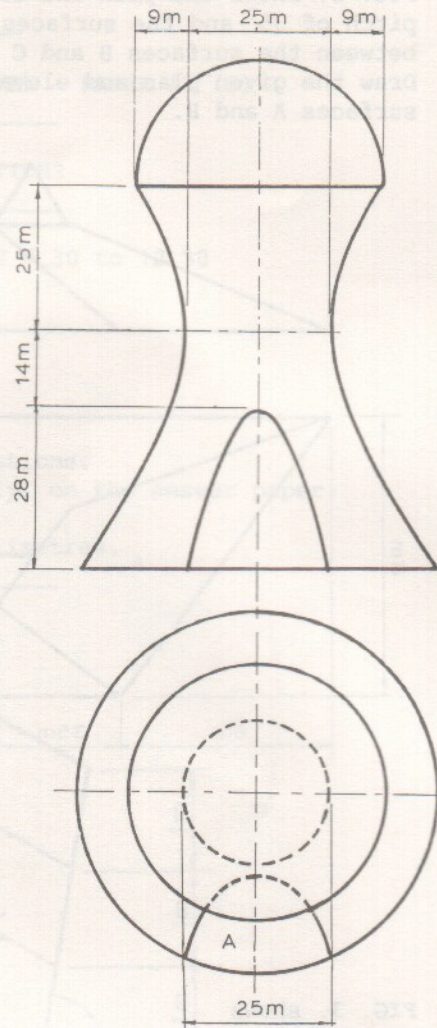
                    Scale 1 : 500

FIG 4

5. On a contour map A and B are two points whose altitudes are 120m and 100m,
    respectively. On the map B is located 120m east of A.

    A vertical bore-hole at A reveals the top surface of a stratum at an altitude
    of 60m and the bottom surface at an altitude of 30m.

    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 80m and 20m respectively.

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

    (b)   A skew bore-hole at A is drilled in an easterly direction in plan. The
          length of this hole as it goes through the stratum is 40m. Determine
          the inclination of this hole to the horizontal plane.

                                                        Scale 1 : 1000

6. FIG. 5. shows the outline plan, elevation and end-view of a church building.
    The hyperbolic paraboloid surfaces ABCD and EFGH are parts of larger hyperbolic
    paraboloid surfaces as shown by the dotted lines.

    (a)   Using six elements in each direction on the larger hyperbolic paraboloid
          surfaces, draw the given plan, elevation and end view.

    (b)   Determine the plane director for the edges BC and AD.

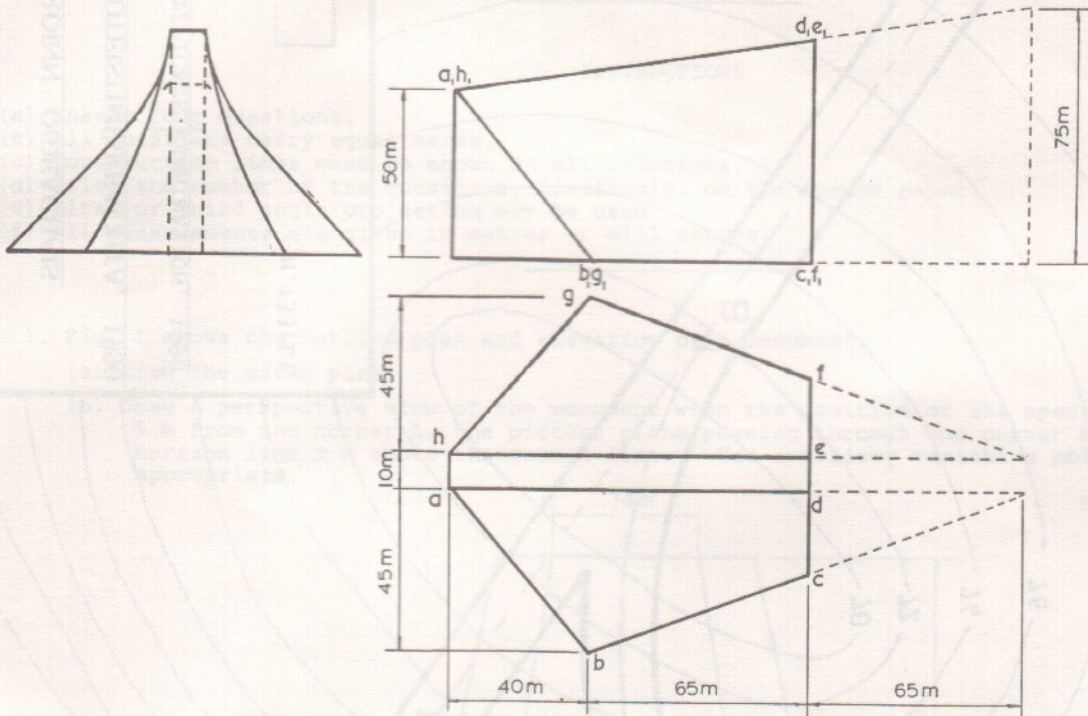   Scale 1 : 1000

FIG. 5

7. The accompanying drawing shows ground contours at two-metre vertical intervals.
    ABCD and BE are the lines of proposed roadways. O is the centre of the
    circular curve.

    The roadways have the following specification:

          (i)   formation width of ABCD and BE is 10m;

          (ii)   A to C is level; B to E is level; gradient C to D is 1 in 20
                  rising;

          (iii)   formation level at A, B, C and E is 86m;

          (iv)   side slopes for cuttings 1 in 2.5;

          (v)   side slopes for embankments 1 in 2.
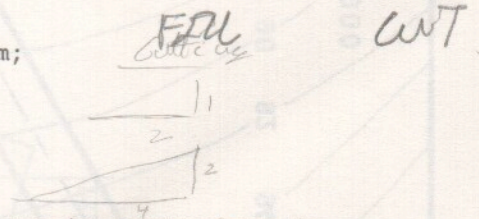
    On the drawing supplied, show the earthworks necessary to accommodate the
    roadways.

Scale
Scála
1:1000