TECHNICAL DRAWING - HIGHER LEVEL - PAPER II (B)

BUILDING APPLICATIONS   (200 marks)

THURSDAY, 20 JUNE - MORNING 9.30 to 12.30

(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.

1.   Fig. 1 shows the outline plan and elevation of a church building which contains eight hyperbolic paraboloid surfaces.

(a)   Draw the given adjoining hyperbolic paraboloid surfaces A and B in plan and elevation.

(b)   Draw an elevation of the surface A in which the true length of the line of intersection between the surfaces A and B shall be seen.

(c)   Determine the plane director for one set of elements on the surface A.
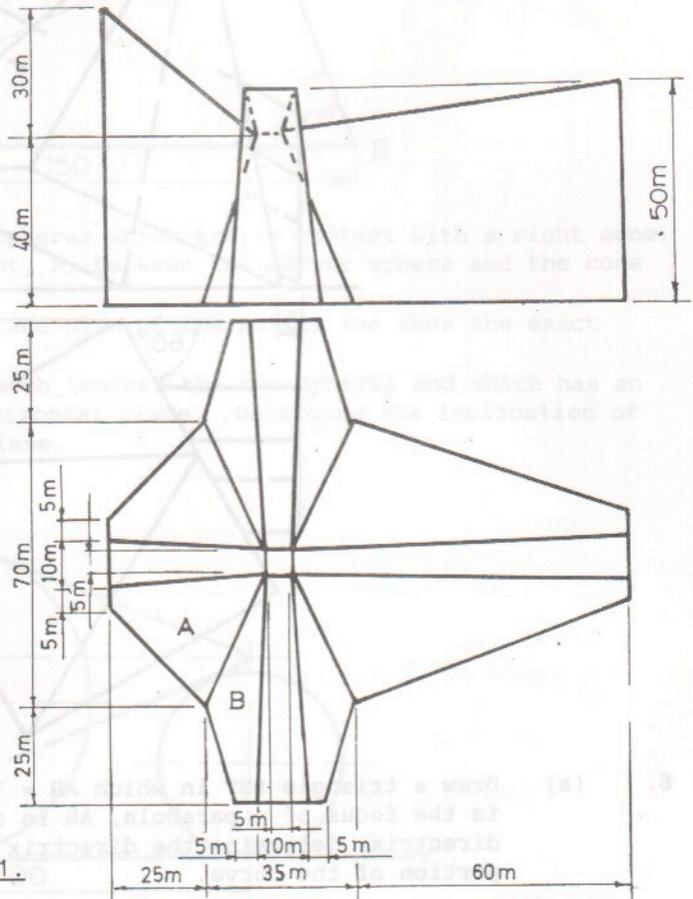
Scale 1 : 500

Fig. 1.

2.   Fig. 2 shows the plan of three adjoining lean-to roof surfaces. The
      surface A has a pitch of 35°, surface B has a pitch of 25° and the
      dihedral angle between surfaces B and C is 150°.
      Draw the given plan, project an elevation and determine the dihedral
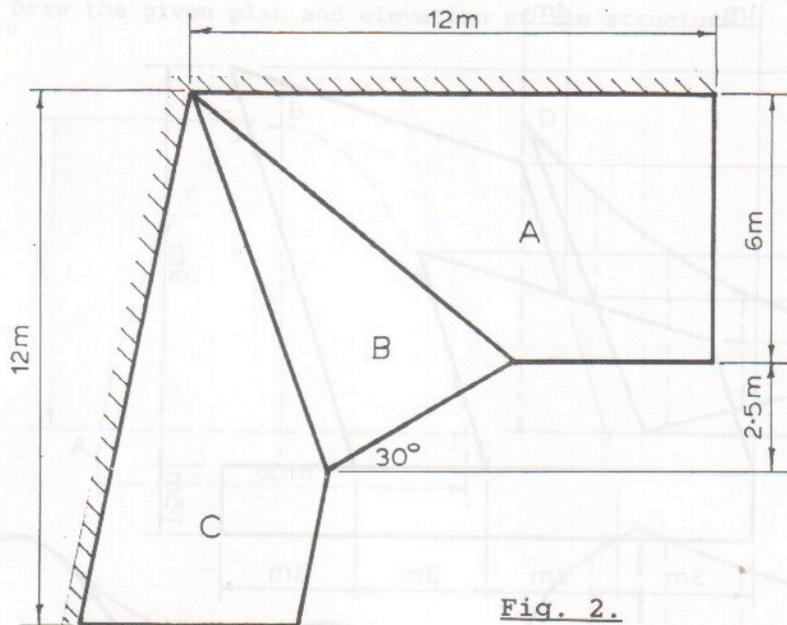   angle between surfaces A and B.

Scale 1 : 100

Fig. 2.

3.   Fig. 3 shows the outline projections of a structure in stone. Draw
      the given plan and elevation and determine the shadows and shade on
      the elevation of the structure when the direction of the light is as
      shown in the figure.
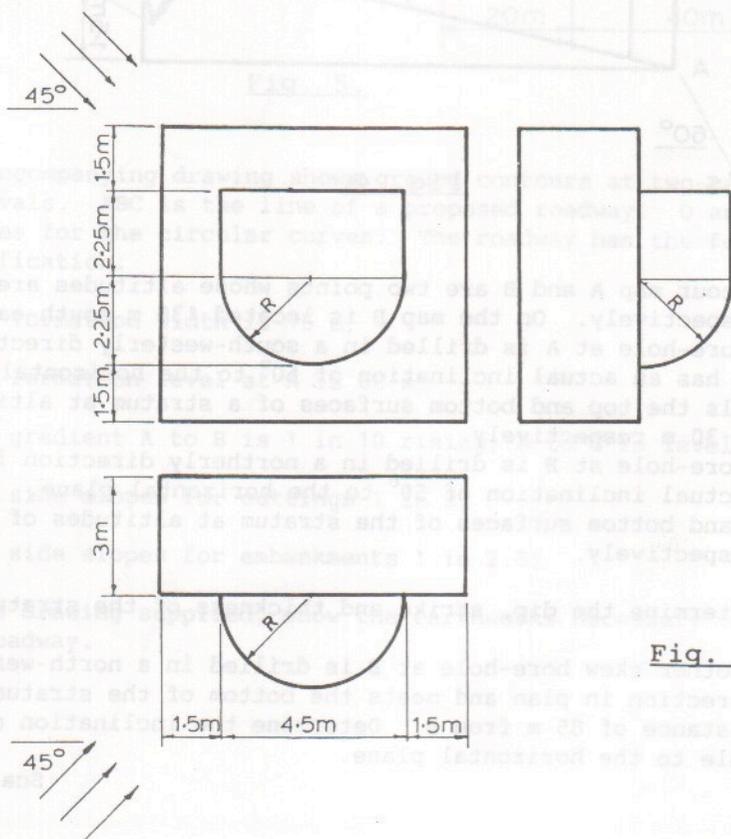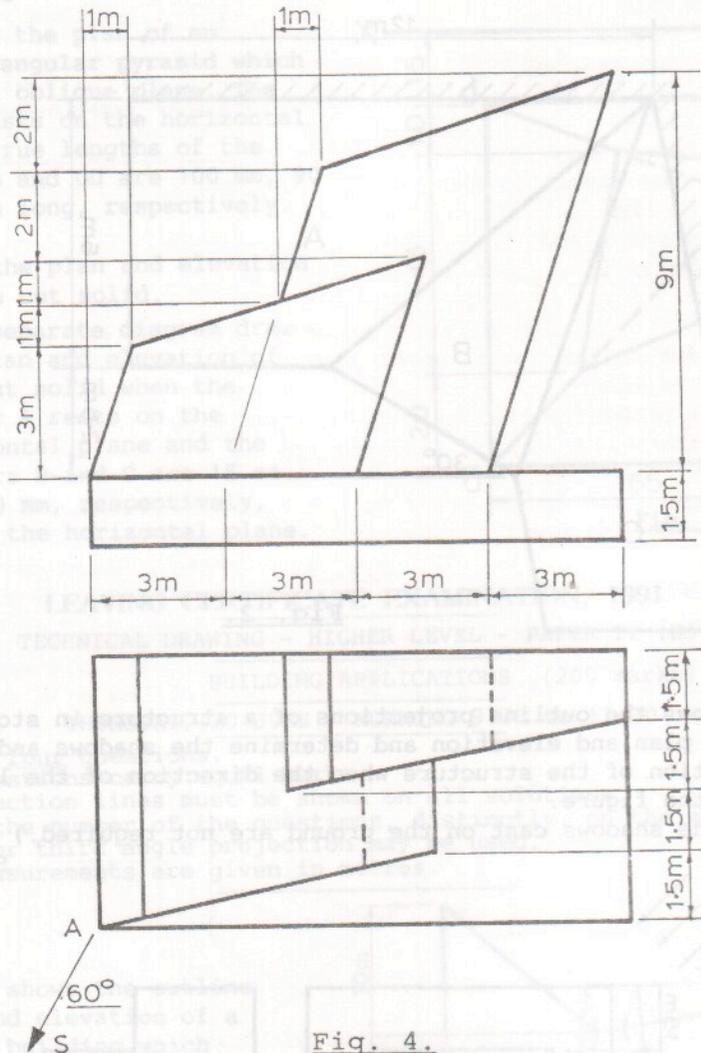   (Note: The shadows cast on the ground are not required.)

Scale 1 : 50

Fig. 3.

4. Draw a perspective view of the structure shown in Fig. 4. The picture plane passes through the corner A, the spectator S is 8 m from the corner A and the horizon line is 7 m above the ground line. Use auxiliary vanishing points where appropriate.

Scale 1 : 100

Fig. 4.

5. On a contour map A and B are two points whose altitudes are 100 m and 80 m, respectively. On the map B is located 130 m south-east of A. A skew bore-hole at A is drilled in a south-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 75 m and 30 m respectively.
A skew bore-hole at B is drilled in a northerly 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 50 m and 25 m, respectively.

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

   (b)   Another skew bore-hole at B is drilled in a north-westerly direction in plan and meets the bottom of the stratum at a distance of 85 m from B. Determine the inclination of this hole to the horizontal plane.

Scale 1 : 1000

6. A spectator stand for an outdoor arena is in the form of a shell
    structure as shown in the pictorial sketch in Fig. 5. The structure
    has a sloping floor as shown. Also shown are the outline plan and
    elevation of the structure. The surface of the unit is generated by
    translating the parabola ABC in a vertical position along the
    parabola DE whose vertex is at E.
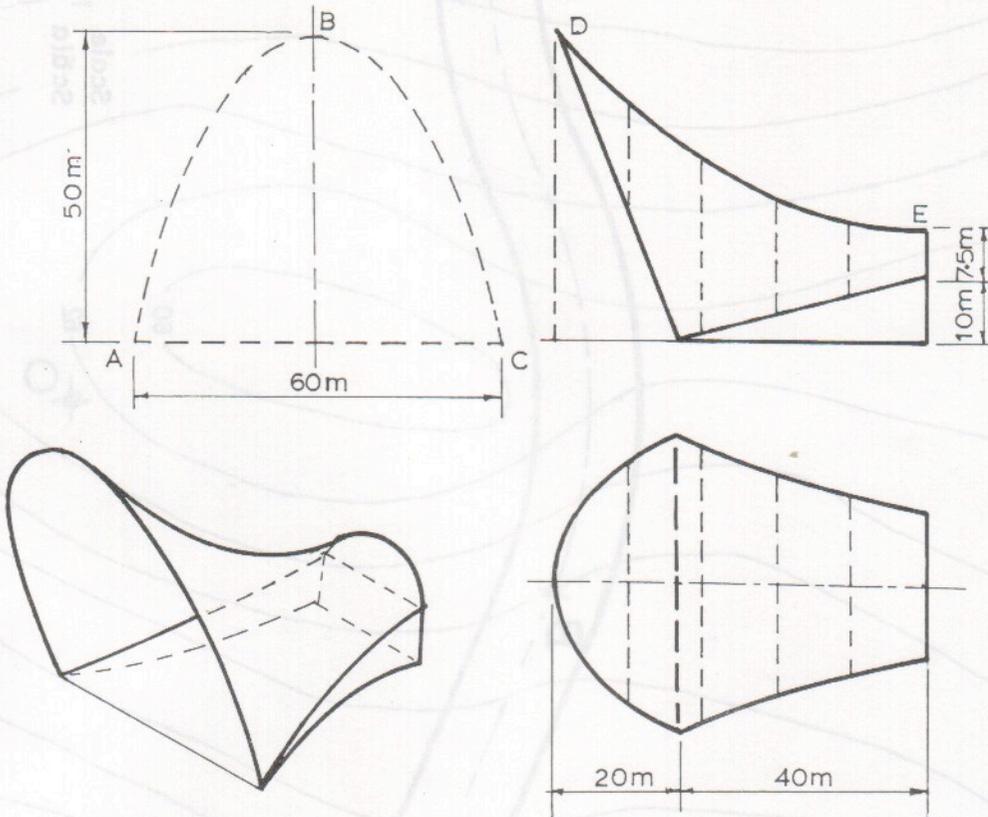   Draw the given plan and elevation of the structure.

    Scale 1 : 500

Fig. 5.

7. The accompanying drawing shows ground contours at two-metre vertical
    intervals. ABC is the line of a proposed roadway. O and O_1 are the
    centres for the circular curves. The roadway has the following
    specification:

    (i)   formation width is 15 m;

    (ii)   formation level at A is 60 m;

    (iii)   gradient A to B is 1 in 10 rising; B to C is level;

    (iv)   side slopes for cuttings 1 in 2;

    (v)   side slopes for embankments 1 in 2.5;

    On the drawing supplied, show the earthworks necessary to accommodate
    the roadway.

AN ROINN OIDEACHAIS

SCRÚDÚ ARDTEISTIMÉIREACHTA, 1991

LEAVING CERTIFICATE EXAMINATION, 1991

M.133(L)

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Examination Number

Scale 1:1000
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