# B. Tech Degree I & II Semester Examination in Marine Engineering June 2011

## MRE 106 ENGINEERING GRAPHICS

(All questions carry **Equal** marks)

Time : 3 Hours                                                                 Maximum Marks : 100

I.   (a)  Inscribe six circles of same size in a regular hexagon of side 25 mm., with each circle touching the other two circles and the two sides of the hexagon.   (10)

(b)  The distance between Phillour and New Delhi is 352 km.  On a road map this is represented by a length equal to 8.8 cm.  Draw a vernier scale, correct up to single kilometer and long enough to measure 600 kilometers.  Mark on this scale a length of 463 cm.   (10)

**OR**

II.  (a)  A point moves in such a way that its distance from a fixed straight line is always 1.5 times the distance from a fixed point, 50 mm away from the fixed line.  Draw the locus choosing at least ten points.  Write the name of the curve.   (10)

(b)  Draw a hypocycloid when the radius of the base circle is 80 mm and radius of the rolling circle is 40 mm.  Locate nine points on the curve and the corresponding centers of the rolling circle.   (10)

III. (a)  The end A of a line AB is in HP and 25 mm infront of VP.  The end B is in VP and 50 mm below HP.  The distance between the end projectors is 75 mm.  Draw the projections of AB and determine its true length and inclinations with HP and VP.  Also locate its traces.   (10)

(b)  A square lamina ABCD of 40 mm side rests on one of its corners on ground.  The plane is inclined at an angle of 30° to the ground and diagonal DB, in plan, inclined at 45° to VP and parallel to HP.  Draw its projections.   (10)

**OR**

IV.  (a)  A line AB, 60 mm long has its end A in HP and 20 mm infront of VP.  If the line is 45° inclined to HP and 30° inclined to VP.  Draw its projections.   (10)

(b)  A pentagonal lamina of sides 30 mm long is standing on a corner on ground, with an edge connected with this corner making 30° with HP.  Draw the projections when the lamina is 45° with VP.   (10)

V.   A cube of edge 30 mm is resting on HP on one of its corners with a solid diagonal perpendicular to VP.  Draw the projections of the solid.   (20)

**OR**

VI.  A hexagonal pyramid, base 50 mm side and axis 100 mm long is lying on the ground on one of its triangular faces with the axis parallel to VP.  a vertical section plane, the HT of which makes an angle of 30° with the reference line, passes through the center of the base and cuts the pyramid, the apex being retained.  Draw the sectional view and true shape of section.   (20)

VII. Draw the development of a right circular cone of base diameter 60 mm and height 64mm resting up on HP on its base.  An insect moves from a point on the base edge to the diametrically opposite point on the same edge through a shortest path along the curved surface.  Mark the shortest path in the front and top views of the cone.   (20)

**OR**

VIII. A pentagonal prism, side of base 40 mm and height 80 mm is resting on its base on HP with a vertical face perpendicular to VP.  It is penetrated centrally by a square prism of face 20 mm and axis 80 mm.  The axes of the two solids intersect at right angles at a point 45 mm above the HP.  The lateral surfaces of the square prism are equally inclined to the HP and VP.  Draw the lines of intersection.   (20)

IX.  A sphere of diameter 40 mm rests centrally on the top smaller end of a frustum of a hexagonal pyramid.  The frustum of the pyramid has 25 mm sides at the top end, 40 mm sides at the base and its 80 mm high.  Draw the isometric projection of the solids.   (20)

**OR**

X.   A square pyramid side of base 40 mm and height 50 mm rests with its base in the ground, a corner of the base touching the 'picture plane and an edge of the base through that corner inclined at 30° to the picture plane.  The station point is 80 mm in front of P.P. and 60 mm above the ground.  The central plane passes through the apex of the pyramid.  Draw the perspective view.   (20)

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