B.Tech. Degree I&II Semester Examination in Marine Engineering May 2013

MRE 106 ENGINEERING GRAPHICS

Time : 3 Hours

Maximum Marks : 100

(5 x 20 = 100)

I. (a) The distance between two places is 100 km and it is represented on a certain map by a line 2.5cm long. Find the RF of the scale of the map. Draw its diagonal scale showing single kilometer and long enough to measure up to 600 km. Indicate a distance of 577 km on this scale.

(b) Trace the conic section when the distance of the focus from the directrix is equal to 30mm and the eccentricity is equal to one. Name the curve.

OR

II. (a) A rectangular plot of land measuring 36 km^2 in area is represented by a similar rectangle of 144 cm^2 in area, on a map. Find the RF of the scale. Draw a backward reading vernier scale, for the map, to show kilometers, hectometers and decameters. Also indicate a distance of 7.56 km on the scale.

(b) A circle of 50mm diameter rolls on a straight line without slipping. Trace the locus of a point P on the circumference of the circle rolling for one revolution. Name the curve. Draw normal and tangent to the curve at any point on the curve.

III. (a) A line AB 65mm long has its end A 25 mm above HP and 15mm in front of VP. The line is inclined at 35° to HP and 55° to VP. Draw its projections.

(b) A rectangular lamina of 40mm x 60mm sides rests on HP on one of its longer sides such that the side is perpendicular to VP and its end point towards the VP is 20mm away from the VP. The lamina is then titled, about the edge on which it rests, till the plane of the lamina is inclined to the HP at 45°. Draw the front, top and profile views of the lamina held in the given position.

OR

IV. (a) A straight line AB is inclined at 45° to HP and 30° to VP. The point A is in HP and the point B is in VP. The length of the straight line is 70mm. Draw the projections of the straight line AB. Also mark the traces.

(b) ABC is a thin rectangular plate having its edges AB, BC and CA equal to 52mm, 70mm and 44mm respectively. The edge AB rests on HP and makes an angle of 30° to VP and has its point A towards VP and 20mm away from it. The plane of the plate is inclined to the HP and 30°. Draw the front and top views of the plate.

V. A tetrahedron of 60mm long edge has one edge parallel to HP and inclined at 50° to VP while a face containing that edge is vertical. Draw its projections.

OR

VI. A pentagonal pyramid, side of base 30mm and length of axis 45mm, is resting on one of its triangular faces on HP with its axis parallel to VP. It is cut by an auxiliary vertical plane inclined at 60° to VP and passing through the highest corner of the base, thus removing the portion containing the apex. Draw the top view sectional front view and true shape of the section.

VII. A hexagonal pyramid side of base 30mm and altitude 65mm rests on one of its triangular faces in the HP. The pyramid is cut by a horizontal cutting plane, which is at a distance of 15mm from the highest point of the pyramid. Draw the development of the surface of the solid remaining below the cutting plane.

OR

VIII. A vertical cone, 80mm base diameter and 100mm as axis, is penetrated by a horizontal cylinder such that the axes of both the solids intersect each other at right angles. The cylinder is 120mm long and 40mm in diameter. The axis of the cylinder is parallel to VP and passes at a point 30mm above the base of the cone. Show the curve of intersection.

IX. A cube of sides 60mm is resting on the ground. A cylinder of base diameter 50mm and height 60mm is kept over that. On top of the cylinder, a hexagonal pyramid of side of base 20mm and altitude 40mm is kept. The axis of the three solids lie in the same vertical line. Draw the isometric projection of the combination of solids.

OR

X. A hexagonal prism, side of base 25mm and height 50mm with its base on the ground plane such that one of its rectangular faces is inclined at 30° to the picture plane and the vertical edge nearer to picture plane is 15mm behind it. The station point is 45mm in front of the picture plane, 70mm above the ground plane and lies in a central plane which is 15mm to left of the vertical edge nearer to the picture plane. Draw the perspective projection of the prism.

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