

B. Tech Degree I & II Semester Examination in Marine Engineering June 2012

MRE 106 ENGINEERING GRAPHICS

Time : 3 Hours

Maximum Marks : 100

- I. (a) Draw an ellipse with major axis 120 mm and minor axis 80 mm. Locate its foci and directrices. Find its eccentricity. Draw a pair of tangents to the ellipse from a point on a directrix 110 mm away from the center of the ellipse. (10)
- (b) A cable of length 8 m is wound on a drum of 2 m diameter with the drum fixed in position so that the cable is always taut. Draw the path traced out by the end of the cable as it is wound completely. (10)

OR

- II. (a) The distance between two stations is 250 km. On a map the equivalent distance measures 5cm. What is RF? Construct a diagonal scale to measure a distance of 800 km and mark on it a distance of 652 km. (10)
- (b) Two points F and F¹ are located on a plane sheet 150 mm apart. A point P on the curve moves in such a way that the differences of its distance from F and F¹ always remains a constant and it is equal to 105 mm. Find the locus of the point and name the curve. Also marks its asymptotes and directrices (10)

- III. (a) A line AB is inclined to both reference planes. Point A is 10 mm behind VP and 20 mm below HP. Point B is 25 mm behind VP and 40 mm below HP. The distance between A and B along XY is 50 mm. Determine the true length and true inclinations of the line with reference planes. (10)
- (b) A regular pentagon of 30 mm side has one side AB parallel to VP and making an angle of 40° with HP. Plane of the pentagon makes 35° with VP. Draw its projections such that the end B of the side AB is 20 mm above the HP and 10 mm in front of VP. (10)

OR

- IV. (a) The top and front views of a line are inclined at 35° and 45° respectively to the XY line. One end of the line is on HP and VP while the other end is 40 mm below HP. Draw the projections of the line and find the true length and inclinations of the line with HP and VP. (10)
- (b) A regular hexagonal lamina, has a side in both HP and VP while the lamina makes an angle of 60° with the VP. Draw its front and top views. Given the side of the lamina as 30 mm. (10)

- V. A hexagonal pyramid, side of base 25 mm and axis 50 mm long has one of its triangular faces in VP and the edge of base contained by that face inclined at an angle of 30° to HP. Draw its projections. (20)

OR

- VI A right circular cone with base diameter 56 mm and height 65 mm rests on its base on HP. A section plane perpendicular to VP and inclined to HP at 45°, cuts the cone meeting its axis at a distance of 36 mm from its base. Draw its sectional top view and true shape of section. (20)

- VII. Draw the development of the lateral surface of a right regular hexagonal pyramid of 45 mm side and height 100 mm. It stands on base on HP, with one of its base edges parallel to VP. A circular hole of 45 mm diameter is drilled through the pyramid in such a way that the axes of the hole is perpendicular to VP and 30 mm above the base. Assume that the axes intersect each other. (20)

OR

- VIII. A vertical hexagonal prism with base side 75 mm and 210 mm long is completely penetrated by a horizontal square prism 75 mm side and 210 mm long. The axis of the horizontal prism is parallel to VP and 4 mm in front of the axis of the hexagonal prism. Draw the projections of these prisms showing the lines of intersection if one of the rectangular faces of the vertical prism is parallel to VP and all the faces of the square prism are equally inclined to HP. (20)

- IX. A cylindrical slab 60 mm diameter and 16 mm thick is surmounted by a cube of 30 mm side. On the top of the cube rests a square pyramid of altitude 30 mm and side of base 24 mm. The axes of the solids are in the same straight line. Draw the isometric projection of the solid. (20)

OR

- X. A cube of edge 30 mm rests with one of its faces on the ground plane such that a vertical edge touches the picture plane. The vertical faces of the cube are equally inclined to the picture plane and behind it. A station point is 40 mm in front of picture plane, 50 mm above the ground plane and lies in a central plane 15 mm to the right of the axis of the cube. Draw the perspective view. (20)