B. Tech. Degree I & II Semester Examination in Marine Engineering May 2015

MRE 1106 ENGINEERING GRAPHICS

Time: 3 Hours   Maximum Marks: 100

(5 × 20 = 100)

I. (a) Two lines AB and CD making an inclination of 80° with each other do not   (10)
         intersect. The line CD is horizontal and the end B of line AB is 20 mm
         below the line CD. If the ends B and C are at a distance of 60 mm draw an
         Ogee curve connecting the ends B and C of the given lines. One arc may be
         drawn at a radius of 15 mm.

    (b) An area of 150 sq.cm on a map represents an area of 50 sq. km in the field.   (10)
         Find the R.F. of the scale used for this map and draw a diagonal scale to
         show kilometer, hectometer and decameter and to measure up to 10 km.
         Indicate on the scale a distance of 7.56 km.

OR

II. (a) Two fixed points are 100 mm apart. A point P moves in such a way that the   (10)
          sum of its distance from the two fixed points is always constant and equal to
          150 mm. Trace the path of the point and name the curve.

     (b) Draw an epicycloid having a generating circle of diameter 50 mm which rolls   (10)
          outside the base circle of diameter 150 mm for one revolution. Also, draw a
          tangent and a normal at any point P on the curve.

III. (a) A line AB, 65 mm long has its end A 20 mm above the HP and 25 mm in   (10)
          front of VP. The end B is 40 mm above the HP and 65 mm in front of the
          VP. Draw the projections of A and B and measure the lengths of top and
          front views.

     (b) Draw the projections of a line AB, 90 mm long, its mid point M being 50 mm   (10)
          above the HP and 40 mm in front of VP. The end A is 20 mm above HP and
          10 mm in front of VP. Show the traces and the inclination of the line with
          the HP and VP.

OR

IV. (a) A circular lamina of 60 mm diameter rests on the HP such that the surface of   (10)
          the lamina is inclined at 30° to the HP. The diameter through the point on
          which the lamina rests on the HP appears to be inclined at 30° in the top
          view. Draw its projections.

     (b) A rectangular plate 60 mm × 40 mm has one of its shorter edges in the VP   (10)
          and inclined at 40° to the HP. Draw its top view if its front view is a square
          of side 40 mm.

V.   A hexagonal prism, side of base 20 mm and axis 70 mm is resting on an edge   (20)
          of base on the HP, inclined at 40° to the VP, with its axis inclined at 60° to
          the HP. Draw the projections of the solid.

OR

VI.   A cylinder 30 mm diameter and 80 mm long is lying on HP with its axis   (20)
parallel to the HP and inclined at 30° to the VP. It is cut by a section plane
perpendicular to the VP inclined at 40° to the HP and passing through the
middle point of the axis of the solid. Draw the front view, sectional top view
and true shape of the section. What are the dimensions of the true shape of
the section?

VII.   A pentagonal pyramid, side of base 30 mm and axis 75 mm is resting on its   (20)
base on the HP, with one edge of base inclined at 30° to the VP. It is cut by a
section plane perpendicular to the VP, inclined at 40° to the HP and passing
through the middle of the axis. Draw the development of the bottom portion
of the pyramid.

OR

VIII.   A pentagonal prism, side of base 40 mm and height length 80 mm is resting   (20)
on its base on the HP with a vertical face perpendicular to the VP. It is
penetrated centrally by a square prism of face 20 mm and axes 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 the
VP. Draw the curves of intersection in the top and front view.

IX.   A rectangular slab 75 mm × 50 mm × 20 mm is surmounted by a cube of 40   (20)
mm side. On the top of the cube, rests a square pyramid of altitude 40 mm
and side of base 25 mm. The axis of the solids are in the same straight line.
Draw the isometric view of the solid.

OR

X.   A rectangular prism 25 mm × 30 mm side and 50 mm long is lying on the   (20)
ground plane on one of its rectangular faces in such a way that one of its
square faces is parallel to and 10 mm behind the picture plane. The central
plane is 60 mm away from the axis of the prism towards the left. Draw the
perspective view of the prism if the station point is located 55 mm in front of
the picture plane and 40 mm above the ground plane. The prism is resting on
the ground plane on its 50 mm × 25 mm rectangular face.

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