B.Tech. Degree I & II Semester Examination in Marine Engineering May 2016

MRE 1106 ENGINEERING GRAPHICS

Time: 3 Hours   Maximum Marks: 100

$(5 \times 20 = 100)$

I. (a) Draw an involute to a circle of ϕ 50 mm. Also draw a tangent and normal to it, at any given point on it.   (10)

    (b) 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 of this map. Draw a backward reading vernier scale for the map to show kilometers, hectometers and decameters. Also indicate on the scale a distance of 7 kilometres, 5 hectometres and 6 decametres.   (10)

OR

II. (a) On a map, a line measuring 1.5 cm represents the actual distance of 1.2 metres. Draw a diagonal scale showing the smallest division of 5 cm and long enough to measure upto 16 metres. Show on this scale a distance of 12.65 metres.   (10)

    (b) Draw a parabola given its double ordinate and abscissa as 72 mm and 40 mm respectively. Draw a tangent and normal at any point on the parabole.   (10)

III. (a) A line AB, has its end A 7 mm behind VP and 18 mm below HP and the end B 38 mm behind the VP and 49 mm below the HP. The distance between the end projectors is 37 mm. Draw the projections of the line and find out its TL and traces.   (10)

    (b) A line PQ, 100 mm long is inclined at 30° to the HP and 45° to the VP. Its midpoint M is in the VP and 20 mm above the HP. Draw its projections, when its end P is in the first quadrant and Q is in the third quadrant.   (10)

OR

IV. (a) Side AB of a regular pentagon ABCDE of 50 mm side, is in VP with its corner A 24 mm above HP. The corner D is 60 mm infront of the VP. Draw its projections if the side AB is inclined at 30° to the HP.   (10)

    (b) A circular disc of ϕ40 mm and negligible thickness rests on HP on its rim and makes an angle of 45° to it. One of its diameters is inclined to VP at 30°. Draw its projections keeping distance of the centre of the disc 40 mm infront of the VP.   (10)

V. A pentagonal pyramid, base 30 mm side and axis 75 mm long is resting on the ground on one of its triangular faces, its axis being parallel to the VP. It is cut by a section plane perpendicular to the VP and inclined at 45° to the HP and passing through the mid point of top view of axis, the apex portion being removed. Draw sectional top view, front view and true shape of section.   (20)

OR

VI. A triangular pyramid 50 mm side, axis 70 mm long is freely suspended from one of the corners of its base. Draw the front and top views of the pyramid when the axis of it makes an angle of 60° with the xy –line.   (20)

VII.   A horizontal cylinder of 50 mm diameter penetrates a vertical cylinder of   (20)
80 mm diameter resting on HP. The two axes are coplanar. The axis of the
horizontal cylinder is 60 mm above the HP. Draw the projection showing the
curves of the intersection.

OR

VIII.   A cone of base diameter 100 mm and height 130 mm rests with its base on HP.   (20)
It is cut by a section plane inclined at 30° to HP and perpendicular to VP.
Draw the development of the truncated cone if the section plane bisects the
axis of the cone.

IX.   A cone, height 60 mm and base circle diameter 40 mm is resting on the top   (20)
face of a square prism, 70 mm height and 50 mm base edge, resting with one
of its edges parallel to the VP. The axis of both the solids coincides. Draw the
isometric view of the combination of solids.

OR

X.   A pentagonal pyramid of height 45 mm and base edge 30 mm is resting on its   (20)
base with one base edge parallel and 10 mm behind and nearer to PP. The
station point is 22 mm infront of PP, 38 mm to the left of the axis and 55 mm
above GP. Draw the perspective view.

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