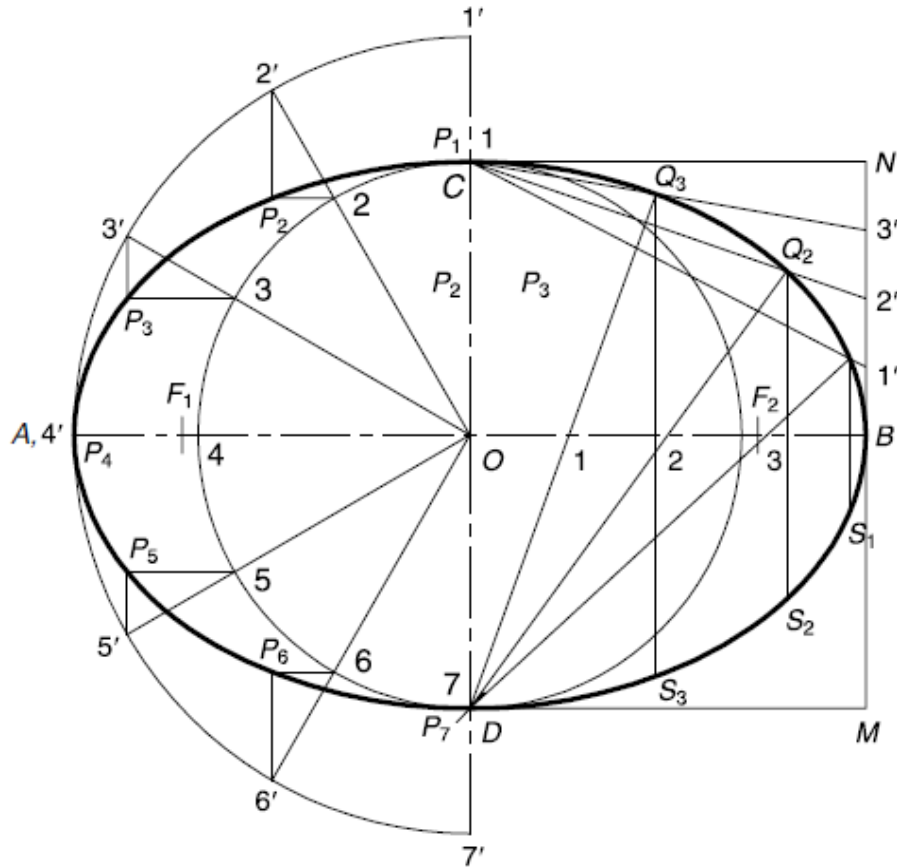


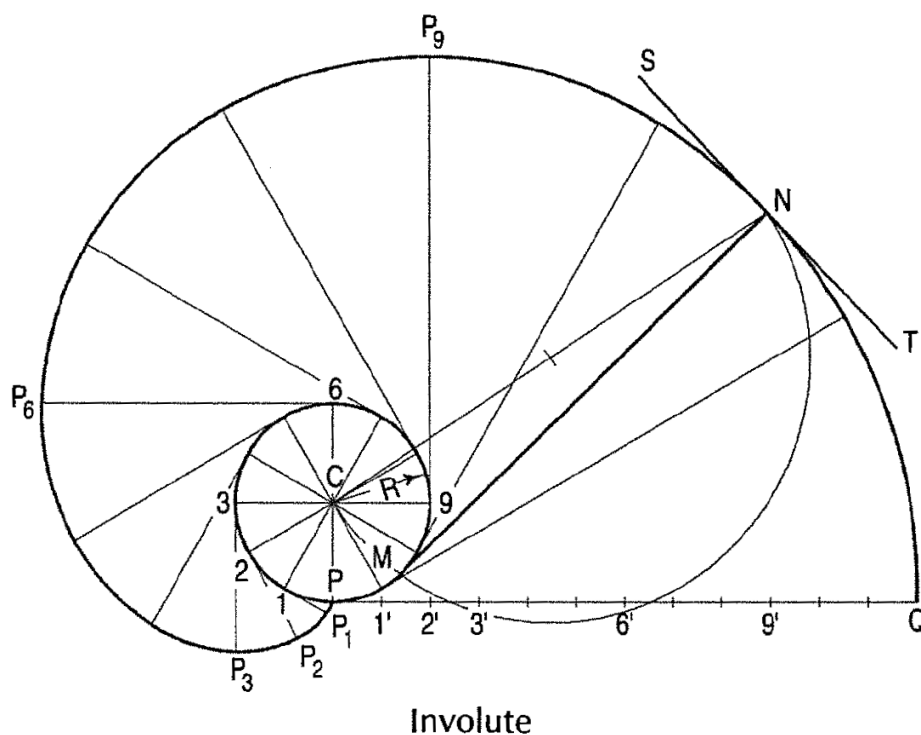
**Class Test: I**  
**2MERC3 Engineering Drawing (Mechanical)**  
**Solutions**

**Note: Attempt all Questions. All Questions carry equal marks.**

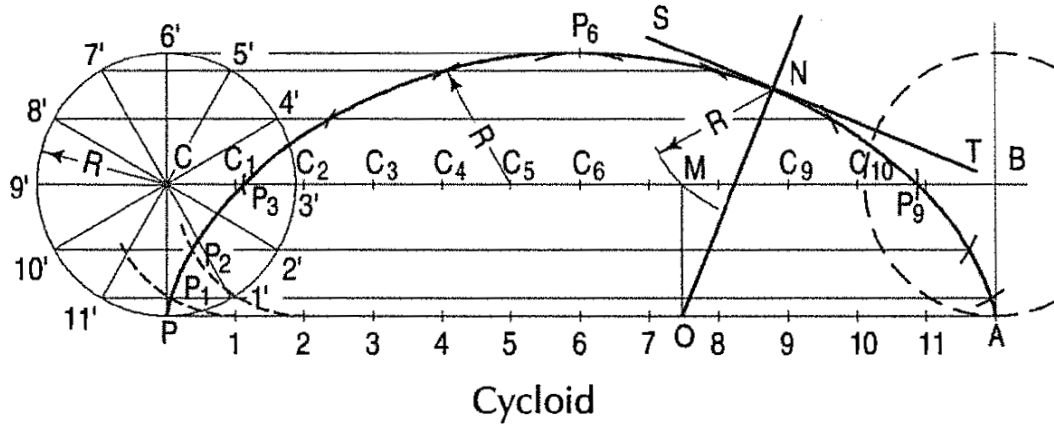
- Q.1. Major axis AB & minor axis CD are 100 mm and 70 mm long respectively. Draw half ellipse by arcs of circles Method and another half by Rectangle Method. [05]



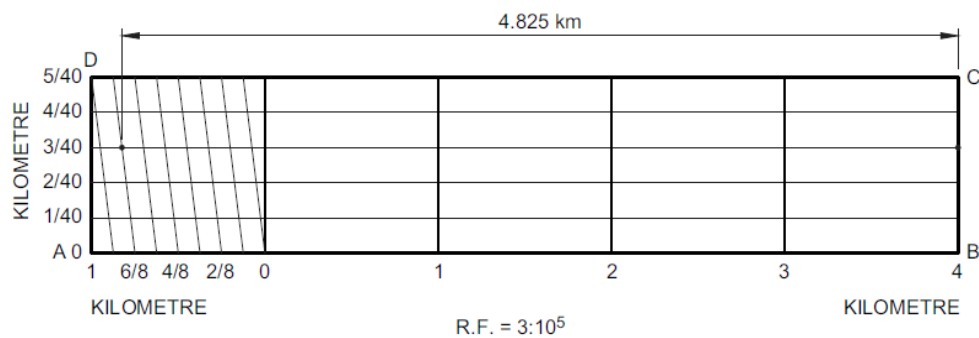
- Q.2. Draw an Involute of a circle with diameter 50 mm. String length is equal to the circumference of circle. [05]



- Q.3. Construct a cycloid having a rolling circle of 50 mm diameter. Draw a tangent and normal to the curve at a point 35 mm above the base line. [05]



- Q.4. Construct a scale to measure kilometre, 1/8th of a kilometre and 1/40th of a kilometre, in which 1 km is represented by 3 cm. Mark on this scale a distance of 4.825 km. [05]



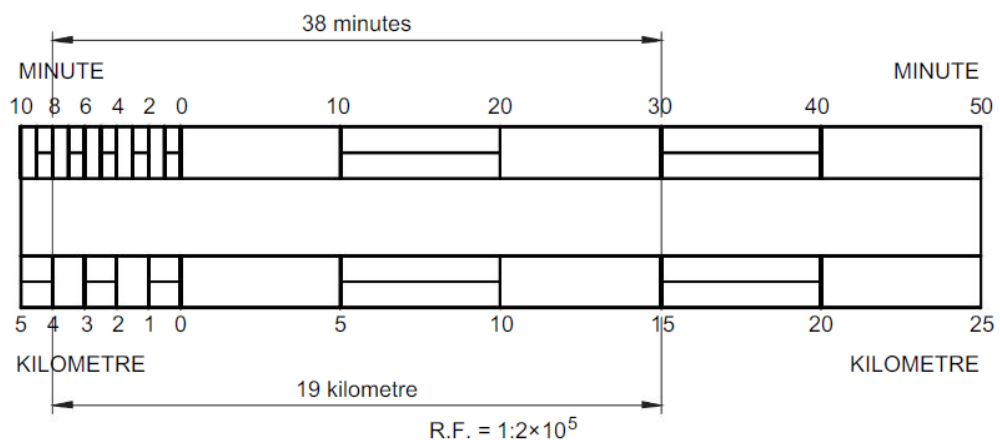
$$R.F. = \frac{3 \text{ cm}}{1 \text{ km}} = \frac{3 \text{ cm}}{1 \times 10^5 \text{ cm}} = \frac{3}{10^5}$$

Since scale has to show a distance of 4.825 km, the maximum length should be at least 5 km.

$$\text{Length of scale, } L_s = R.F. \times \text{Maximum length} = \frac{3}{10^5} \times 5 \times 10^5 \text{ cm} = 15 \text{ cm}$$

The breakup of 4.825 km is  $4 \text{ km} + 6 \times \frac{1}{8} \text{ km} + 3 \times \frac{1}{40} \text{ km}$ .

- Q.5. The distance between two cities is 150 km. A passenger train covers this distance in 5 hr. Construct a scale to measure the distance covered by the train in a single minute and up to 1 hour. The scale is drawn to  $1:2 \times 10^5$ . Show the distance travelled in 38 minutes. [5]



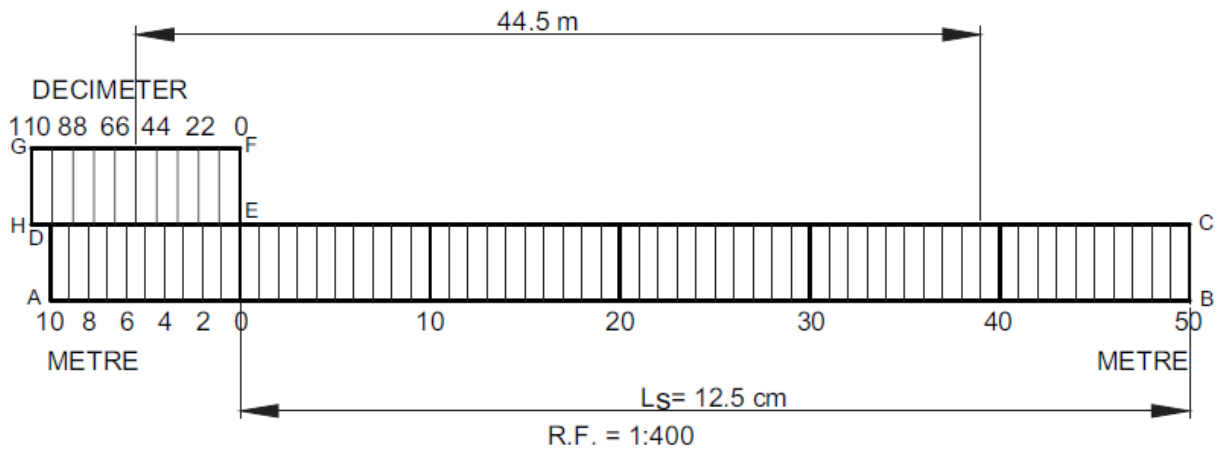
The distance covered in 1 hour =  $150/5 = 30 \text{ km}$ .

Length of scales,  $L_s = R.F. \times \text{Maximum length}$

$$L_s (\text{time scale}) = \frac{1}{2 \times 10^5} \times 30 \times 10^5 \text{ cm} = 15 \text{ cm}$$

$$L_s (\text{metric scale}) = \frac{1}{2 \times 10^5} \times 30 \times 10^5 \text{ cm} = 15 \text{ cm}$$

Q.6. If 1 cm long line on a map represents a real length of 4 m. Calculate the R.F. and draw a vernier scale long enough to measure up to 50 m. Show a distance of 44.5 m on it. [5]



Q.7. Construct a scale of chords showing  $5^\circ$  divisions and with its aid set-off angles  $40^\circ$ ,  $55^\circ$  and  $130^\circ$ . [5]

