



ST.ALOYSIUS INSTITUTE OF TECHNOLOGY, JABALPUR
DEPARTMENT OF MECHANICAL ENGINEERING
SUBJECT- ENGINEERING GRAPHICS (B.E-105)
ASSINGMENT – I

1. Construct a scale of 1:500 to read single meter and long enough to measure upto 70 m. Show a distance of 46 m on it.
2. Construct a diagonal scale showing yards, feet and inches in which a 2 inch long line represent 1.25 yards and the scale is long enough to measure upto 5 yards. Find R.F. and mark a distance of 4 yards 2 feet 8 inches.
3. Construct a scale of 1:5 to show decimeters and centimeters and long enough to measure upto 1 m. Show a distance of 6.3 dm on it.
4. A room of 1728 m^3 volume is shown by a cube of 216 m^3 volumes. Find R.F. and construct a plain scale to measure upto 42 m. mark a distance of 22 m on it.
5. Construct a diagonal scale of R.F = $1/6250$ to read upto 1 kilometer and to read meters on it. Show a length of 653 meter on it.
6. Construct a scale of chords showing 5° divisions and with its aid, set-off angles of 65° and 125° .
7. Two fixed points A and B are 80 mm apart. Trace the complete path of a point P moving in such a way that the sum of its distance from A and B is always the same and equal to 110 mm.
8. Draw a rectangular hyperbola when the position of a point P on the curve is 30 mm from the horizontal asymptote and 50 mm from the vertical asymptote. Show at least four points on either side of point P.
9. Draw a cycloid for one complete revolution of a circle having a 60 mm dia. Draw a tangent and a normal to the curve at a point that is 45 mm above the base line.
10. Draw an involute of a hexagon having a 25mm side.
11. Draw the locus of a point P moving so that the ratio of its distance from a fixed point F to its distance from a fixed straight line DD' is $\frac{3}{4}$. Also draw tangent and normal to the curve from any point on it.
12. Construct an ellipse given the distance of the focus from the directrix as 60 mm and eccentricity as $\frac{2}{3}$. Also draw tangent and normal to the curve at a point on it 20 mm above the major axis.
13. Construct a parabola given the distance of the focus from the directrix as 50 mm. Also draw tangent and normal to the curve from any point on it.
14. Draw the locus of a point P moving so that the ratio of its distance from a fixed point F to its distance from a fixed straight line DD' is 1. Also draw tangent and normal to the curve from any point on it.
15. Draw a hyperbola when the distance between the focus and directrix is 40 mm and the eccentricity is $\frac{4}{3}$. Draw a tangent and normal at any point on the hyperbola.
16. Draw the involute of a square of side 30 mm. Also draw tangent and normal to the curve from any point on it.
17. Coir is unwound from a drum of 30mm diameter. Draw the locus of the free end of the coir for unwinding through an angle of 360° . Draw also a tangent and normal at any point on the curve.
18. A circle of 50 mm diameter rolls along a straight line without slipping. Draw the curve traced by a point P on the circumference for one complete revolution. Draw a tangent and normal on it 40 mm from the base line.



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19. A circle of 46 mm diameter rolls on a horizontal line for a half revolution and then on a vertical line downwards for another half revolution. Draw the curve traced out by a point P on the circumference of the circle. Assume that the horizontal and the vertical line constitute a corner.
20. Draw an epicycloids generated by a rolling circle of diameter 40 mm and the diameter of the directing circle is 140 mm. Also draw tangent and normal to the curve from any point on it.
21. Draw a hypocycloid generated by a rolling circle of diameter 50 mm and the diameter of the directing circle is 240 mm. Also draw tangent and normal to the curve from any point on it.
22. Draw an Archimedean spiral of two convolutions, the greatest and the least radii being 115 mm and 15 mm respectively. Draw a tangent and a normal to the spiral at a point, 65 mm from the pole.
23. In a logarithmic spiral, the shortest radius is 40 mm. the length of adjacent radius vectors enclosing 30° are in the ratio 9:8. Construct one revolution of the spiral. Draw a tangent and a normal to the spiral at a point distant 70 mm from the pole.

