

Agnihotri Engineering & GATE Classes

Scripting success stories

SPECIAL ENGINEERING CURVES

CYCLOID CURVES

(Cycloids, Epicycloids & Hypocycloids)

Q.1) A circle of 50 mm diameter rolls on a straight line without slipping . Draw the curve traced out by any point P on the circumference of circle for one complete revolution of circle ?

Q.2) A circle of 50 mm diameter rolls on a horizontal line for half revolution & then on a vertical line downwards for another half revolution. Draw the curve traced out by point P ?

Q.3) A circle of 50 mm diameter rolls on a horizontal line for half revolution & then on a vertical line upwards for another half revolution . Draw the curve traced out by any point P which is on the circumference of circle ?

Q.4) A circle of 50 mm diameter rolls on the circumference of another circle of 175 mm diameter & outside it. Draw the curve traced out by a point on the circumference of rolling circle for one complete revolution & name the curve also? Draw the tangent to it at a point 125 mm from the center of directing circle ?

Q.5) A circle of 40 mm diameter rolls on the circumference of another circle of 60 mm diameter & outside it. Draw the curve traced out by any point P on the circumference of rolling circle for one complete revolution?

Q.6) Construct a hypocycloid generated by any point P on the circumference of rolling circle when the diameter of directing circle is 175 mm & the diameter of rolling circle is 50 mm for one complete revolution. Also draw the normal & tangent on the curve at a point 50 mm away from the center of directing circle ?

Q.7) Construct a hypocycloid generated by a point on the circumference of rolling circle of radius 30 mm which rolls inside the directing circle of radius 60 mm .

INVOLUTES

Q.8) Draw an involutes of an equilateral triangle of side 20 mm.

Q.9) Draw an involutes of a square having side 30 mm?

Q.10) Draw an involutes of a regular pentagon of side 20 mm?

Q.11) Draw an involutes of a regular hexagon of side 20 mm?

Q.12) Draw an involutes of a circle of diameter 40 mm. Also draw normal & tangent at a distance of 100 mm from the center of the circle over formed involute ?

Q.13) A thread unwinds itself from a cylindrical drum having diameter 60 mm. Draw the locus of the free end of the thread for unbinding through an angle of 180° ?

SPIRAL CURVES

(Archemedian Spiral & Logarithmic Spiral)

Q.14) Construct an archemedian spiral for one complete convolution when the radius of circle is 60 mm ?

Q.15) Construct an archemedian spiral for one & half convolution when the radius of circle is 90 mm. Also draw the normal & tangent at any point on the spiral ?

Q.16) A point P moves towards another point O , 75 mm from it & reaches it while moving around it once ,its movement towards O is uniform with its movement around it . Draw the curve traced out by point P ?

Q.17) Construct an archemedian spiral for two convolutions , when the greater & least radii are 100 mm & 15 mm long respectively. Draw a tangent & a normal at a point 65 mm from the pole on the spiral ?

Q.18) A link 225 mm long ,swings on a pivot O from its vertical position of rest to the right through an angle of 75° & return to its initial position at uniform velocity .During that period , a point P moving moving at uniform speed along the center line of the link from a point at a distance of 25 mm from O, reaches the end of the link. Draw the locus of the point P ?

Q.19) Construct a logarithmic spiral for 1 convolution , given the length of shortest radius is 1 cm & the ratio of lengths of radius vectors enclosing an angle of 30° is $10/9$. Also draw normal & tangent at any point on the spiral ?

Q.20)Construct a logarithmic spiral for one revolution whose shortest radius is 40 mm. & the lengths of adjacent radius vectors enclosing 30° angle are in the ratio $9/8$? Also draw the normal & tangent to the spiral at any point on it ?

Classes on (ED,BEEE,M1,M2,M3,NA,CONTROL,DSP & other GATE oriented Engineering Subjects)

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