

- Q No 1- Sketch the graph of the vector functions
 $F(t) = (3-t) i + (2t)j + (3t - 4)k$ for all (t)
- Q No 2- Sketch the graph of the function
 $F(t) = (2\sin t)i - (2\cos t)j + (3t) k$
- Q No 3- What is the difference between absolute and relative maxima of a function?
- Q No 4- State the extreme value theorem?
- Q No 5- What is a vertical asymptote? and horizontal asymptote?
- Q No 6- State L' hospital rule?
- Q No 7- What is the Zero derivative theorem?
- Q No 8- Determine the largest and smallest value of
 $F(x) = x^4 - 2x^5 + 5$ on the closed interval $[0, 1]$?
- Q No 9- What is a vector value function?
- Q No 10- What is a smooth curve?
- Q No 11- Sketch the graph of $R(t) = (3\cos t)i + (3\sin t)j + tk$
 Find the length of curve from $t = 0$ to $t = 2\pi$?
- Q No 12- What is the formulas for the motion of flight and range a projectile?
- Q No 13- State the following rules for differentiating vector function:
 a)- Linearity rule
 b)- Scalar multiple rule

c)- Dot product rule

Q No 14- State Kepler's Law ?

Q No 15- State the theorem about the orthogonality of a vector function of constant length and its derivative?

Q No 16- Evaluate maxima and minima of $\cos x - \sin x$?

Q No 17- A manufacturer finds that the demand function for a certain product is

$$x(p) = 73/\sqrt{p}$$

Should the p be raised or lowered to increase consumer expenditure? Explain your answer.

Q No 18- Identify and sketch the curve $xy = 1$.

Q No 19- Rotate the coordinate axes to remove the xy -term. Then name conic and sketch its graph.

(i) $my = -9$

(ii) $x^2 + 4xy - 2y^2 - 6 = 0$

Q No 20- Show that the graph of the equation

$$\sqrt{x} + \sqrt{y} = 1$$

Is a portion of a parabola?

Q No 21- Find the value of x , $x > 0$, where $y = x^3$ has maximum curvature.

Q No 22- At what point(s) does $y = e^x$ have maximum

curvature.

Q No 23- Find the equation of ellipse that satisfies the given condition.

a) Ends of major axis $(\pm 3, 0)$; ends of minor axis $(0, \pm 2)$

b) Length of major axis 26; foci $(\pm 5, 0)$.

Q No 24- Find an equation of parabola that satisfies the given conditions;

Vertex $(0, 0)$; focus $(3, 0)$.

Focus $(6, 0)$; directrix $x = -6$.

Q No 25- Find the Rectangular coordinates of point P whose polar coordinates are $(6, 2\pi/3)$.

Q No 26- Find the polar coordinate of point p whose rectangular coordinates are $(-2, 2, \sqrt{3})$.

Q NO 27- Find the highest point on the cardioid $r=1+\cos\alpha$.

Q No 28- Find the left most point on the upper half of the cardioid $r=1+\cos\alpha$.

Q No 29- Sketch the hyperbola and label the vertices, foci and asymptotes of the given function

$$x^2/16 - y^2/4=1.$$

Q No 30- Sketch the parabola and label the vertices, foci and directrix of the given function

$$y^2 = x + 4y + 2.$$

Q No 31- Sketch the ellipse and label the vertices, foci and end of the minor axis of the given function

$$x^2/16 + y^2/4 = 1.$$

Q No 32- Find the equation of the ellipse traced by a point that moves so that the sum of its distance to (4, 1) and (4, 5) is 12.

Q No 33- Find the equation of the parabola traced by a point that moves so that the difference of its distance to (0, 0) and (1, 1) is 1.

Q No 34- A line tangent to the hyperbola $4x^2 - y^2 = 36$ intersects the y axis at the point (0, 4). Find the points of tangency.

Q No 35- Find the coordinates of all the points on the hyperbola $4x^2 - y^2 = 4$ where the two lines that passes through the point and the foci are perpendicular.

Q No 36- Sketch the graph of $r^2 = 4\cos 2\theta$ in polar coordinates.