

UNIT –I 1) STRAIGHT LINE			
Sl. No	Questions	Ma rks	Year
1	Find the value of k, if the lines $(14+k)x+4y-3=0$ & $8x-3y+1=0$ are perpendicular.	3	Apr-2016
2	Find the slope, x-intercept and y-intercept of the line $2x+3y-11=0$	3	Nov-2016
3	Find the equation of straight line passing through the point (3,2) & having slope 5?	3	Apr-2017/Apr-2019
4	Find the equation of straight line cutting off y-intercept 5 units & making inclination 135° .	3	Nov-2017
5	Find the slope of straight line whose inclination with x-axis is 135° .	3	Apr-2018
6	Find the equation of straight line passing through the point (2,3) & having slope 5?	3	Nov-2018
7	Find the equation of line passing through the point (5,2) & parallel to the line $4x-3y+1=0$.	5	Apr-2016/ Apr-2019
8	Find the equation of line passing through the midpoint of line joining the points (2,4) & (6,8) & having slope 2.	5	Nov-2016
9	Find the equation of line passing through the point (3,4) & perpendicular to the line $3x+4y-8=0$	5	Apr-2017
10	Find the equation of line passing through the point (4,3) & parallel to the line $3x+5y-3=0$.	5	Nov-2017
11	Find the equation of line passing through the point (-3,2) & perpendicular to the line $4x-y+7=0$	5	Apr-2018
12	Find the equation of line passing through the point (6,-4) & perpendicular to the line $7x-6y+3=0$	5	Nov-2018
13	Find the equation of line passing through the point(5,2) & (-3,3) & also find the slope & y-intercept of the line.	6	Apr-2016
14	Find the equation of line passing through the point (-2,1) & perpendicular to the line joining (-7,3) & (2,7)	6	Nov-2016
15	Find the equation of median through A of the triangle ABC where A(-1,3), B(-3,5) & C(7,-9).	6	Apr-2017
16	Find the equation of straight line passing through the point(4,-3) & (2,1).Also find slope & y-intercept.	6	Nov-2017
17	Find the equation of median through B of the triangle ABC where A(3,-1), B(2,4) & C(-9,5).	6	Apr-2018
18	Find the equation of straight line passing through the point(5,2) & (-3,3).Also find slope & y-intercept.	6	Nov-2018
19	Find the equation to perpendicular bisector of the line joining the points (6,8) & (4,2)	6	Apr-2019

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II) CONIC SECTION			
Sl. No	Questions	Marks	Year
1	Find the focus & equation to directrix of parabola $y^2=16x$	3	Apr-2016
2	Find the focus, vertex & length of latus rectum of the parabola $y^2=28x$	3	Nov-2016/Nov-2018
3	Find the equation of parabola with focus at (3,0) & x-axis is the axis of parabola.	3	Apr-2017/ Apr-2019
4	Find the focus & equation to directrix of parabola $y^2=40x$	3	Nov-2017
5	Find eccentricity, distance between the foci, & equation of directrix for the hyperbola $\frac{x^2}{25} - \frac{y^2}{16} = 1$	6	Apr-2016
6	Find eccentricity, length of axis, & foci of hyperbola $\frac{x^2}{36} - \frac{y^2}{25} = 1$	6	Nov-2016
7	Find the co-ordinates of foci, the vertices, the length of latus rectum, eccentricity of an ellipse $\frac{x^2}{36} + \frac{y^2}{16} = 1$	6	Apr-2017/ Apr-2019
8	Find the eccentricity, foci, & equation to directrix for an ellipse $\frac{x^2}{16} + \frac{y^2}{9} = 1$	6	Nov-2017/ Apr-2018
9	Find the equation of ellipse given that vertices are $(\pm 6,0)$ & eccentricity $e=3/4$.	6	Apr-2018
10	Find eccentricity, distance between the foci, & equation of directrix for the hyperbola $\frac{x^2}{25} + \frac{y^2}{9} = 1$	6	Nov-2018
UNIT-2 DIFFERENTIATION			
Sl. No.	Questions	Marks	Year
1	If $y=\sin^{-1}x+2e^{3x}-4\sqrt{x}$, find $\frac{dy}{dx}$.	3	Apr-2016
2	If $y=(4x^2-3\cos x)^{10}$, find $\frac{dy}{dx}$.	3	Apr-2016
3	If $y=(3+2\sinh x)\cos x$, find $\frac{dy}{dx}$.	3	Apr-2016
4	Differentiate $x^2 \cdot \sin x$ with respect to x	3	Apr-2019
5	If $y=x^x$, find $\frac{dy}{dx}$.	3	Apr-2016/ Apr-2017
6	If $y=\tan^{-1}x+5\log x-2e^{3x}$, then find $\frac{dy}{dx}$.	3	Nov-2016
7	Differentiate $x^4+\log x-\tan^{-1}x$ w.r.t. x .	3	Apr-2019
8	If $y=\log\sqrt{\sin x}$, find $\frac{dy}{dx}$	3	Nov-2016
9	If $y=x^{1/x}$, find $\frac{dy}{dx}$.	3	Nov-2016
10	If $x=\sin^{-1}t$ & $y=\cos^{-1}t$, find $\frac{dy}{dx}$	3	Nov-2016
11	If $y=10x^4+3e^{2x}-\cos^{-1}x$, find $\frac{dy}{dx}$	3	Apr-2017
12	If $y = \frac{\log x}{1+\sin x}$, find $\frac{dy}{dx}$.	3	Apr-2017
13	If $x=2\sin^3t$ & $y=2\cos^3t$, find $\frac{dy}{dx}$	5	Apr-17/ Apr-2016/

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14	If $y=(x^2+5x) \log x$ find $\frac{dy}{dx}$	3	Nov-2017
15	If $y=(3x^2-4x+5)^6$, find $\frac{dy}{dx}$.	3	Nov-2017
16	If $x^2+y^2=a^2$, find $\frac{dy}{dx}$.	3	Nov-2017/Apr-2019
17	Differentiate with respect to x , x^3e^x	3	Apr-2018
18	If $y=\log(\sin 2x)$, find $\frac{dy}{dx}$	3	Apr-2018
19	If $x=1/t$ & $y=\log t$, find $\frac{dy}{dx}$	3	Apr-2018
20	If $x= \cos\theta$ and $y= \sin\theta$ find $\frac{dy}{dx}$	3	Apr-2019
21	Differentiate with respect to x $\sin x$ with respect to x .	3	Nov-2018
22	If $y= \log(\sin x)$, find $\frac{dy}{dx}$	3	Nov-2018
23	If $x=at, y=at^2$, find $\frac{dy}{dx}$	3	Nov-2018
24	Find $\frac{dy}{dx}$ if $y = \frac{1+x^2}{1-x^2}$	5	Apr-2016/Nov-2017 / Apr-2019
25	If $y=\sin(\log x)$, show that $x^2y_2+xy_1+y=0$	5	Apr-2016
26	If $y = \frac{\sinh x}{1+\sinh x}$, find $\frac{dy}{dx}$.	5	Nov-2016
27	If $y=e^{\tan^{-1}x}$, prove that $(1+x^2)y_2+(2x-1)y_1=0$	5	Nov-2016/ Apr-2017 Apr-2018
28	Differentiate, $4\sqrt{x}+3/x^2-\log x+\tan^{-1}x-\cos 3x$ wrt x .	5	Apr-2018
29	If $y=e^{ax} + e^{-ax}$, show that $d^2y/d^2x=a^2y$	5	Apr-2017
30	If $y=\tan^{-1}x$, show that $(1+x^2)y_2+2xy_1=0$	5	Nov-2017/Nov-2018/ Apr-2019
31	If $y=(\sec x)^x$, find $\frac{dy}{dx}$	5	Nov-2017
32	Find $\frac{dy}{dx}$ if $y = \frac{1-\tan x}{1+\tan x}$	5	Apr-2018/Nov-2018
33	Differentiate $\sin x$ from first principle	5	Apr-2016/Nov-2017 Apr-2018/Nov-2018 / Apr-2019
34	Differentiate $\cos x$ from first principle	5	Nov-2016/Apr-2017
35	Find $\frac{dy}{dx}$ if $x^2+2xy+y^2=0$	5	Nov-2018

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36	$x^3+y^3+3x^2y-3x=25$ then find $\frac{dy}{dx}$	6	Apr-2016
37	$x^3+y^3-3xy^2-3y=15$ then find $\frac{dy}{dx}$	6	Nov-2016
38	If $y=(\sin x)^{\cos x}$, find $\frac{dy}{dx}$	6	Apr-2017
39	If $y=\frac{x.\sin x}{1+x^2}$, find $\frac{dy}{dx}$.	6	Apr-2018
40	If $y=e^{m.\sin^{-1}x}$, prove that $(1-x^2).y_2-x.y_1-m.y=0$	6	Nov-2017
41	Find $\frac{dy}{dx}$, if $x= a.\cos^3\theta$, $y= a.\sin^3\theta$, at $\theta = \pi/4$	6	Nov-2018
42	If $y=(\sin x)^x$, find $\frac{dy}{dx}$	5	Apr-2019
43	If $y= a \cos t + b \sin t$, prove that $\frac{d^2y}{dx^2}+y=0$	5	Apr-2019
UNIT-3 APPLICATIONS OF DIFFERENTIATION			
Sl. No.	Questions	Marks	Year
1	Find the equation of tangent to the curve, $y=2x^2-3x-1$ at (1, 2).	3	Apr-2016/Nov-2017
2	Find the slope of tangent to the curve $y= x^2+5x-2$ at (1,4)	3	Apr-2019
3	Find the equation of tangent to the curve, $y=3x^2+4x$ at (1, 2).	3	Nov-2016/Apr-2018
4	If slope of tangent to the curve $1+x^3/3$ is 4. Then find the value of x.	3	Apr-2017
5	Show that the function $y=2x^2-3x$ is increasing at the point (1,-1).	3	Apr-2018
6	The equation of motion is given by, $S=t^3-2t^2-4t+20$ then find the velocity after 2s.	3	Apr-2016/ Apr-2017/ Apr-2018
7	The equation of motion is given by, $S=3t^2+4t+6$ then find the velocity after 2s.	3	Nov-2016/Nov-2017 / Apr-2019
8	The equation of motion is given by, $S=6t^3-5t^2+4$ then find the velocity after $t=2s$	3	Apr-2018
9	Find the equation of tangent to the curve, $y=x^2-3x+2$, at (1, 0).	3	Nov-2018
10	The radius of sphere is increasing at the rate of 4cm/sec. Find the rate of increase of volume where radius is 10cm.	5	Apr-2016
11	If area of circular plate increasing at rate of 2cm ² /sec. Find the rate of increase of radius where radius is 14cm.	5	Apr-2017
12	The volume of spherical ball is increasing at the rate of 36π cc/s.Find the rate at which the radius is increasing when the radius of the ball is 2cm.	5	Nov-2016/ Nov-2017
13	The volume of spherical ball is increasing at the rate of 50π cc/s.Find the rate of increase of radius, when the radius of the ball is 10cm.	5	Apr-2018
14	The volume of sphere is increasing at the rate of 20π cc/s.Find the rate of increase of radius, when the radius is 4cm.	5	Nov-2018

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19	Evaluate $\int \frac{(\tan^{-1} x)^{10}}{1+x^2} dx$	5	Nov-2017
20	Evaluate $\int \sqrt{3 + \tan x} \cdot \sec^2 x dx$	6	Apr-2019
21	Evaluate $\int_0^1 (3x^2 - 6x + 2) dx$.	5	Nov-2018
22	Evaluate $\int \tan^{-1} x dx$	6	Apr-16/ Nov-16 Apr-17/Nov-18
23	Evaluate $\int \tan^4 x dx$	6	Nov-2016
24	Prove that $\int \frac{1}{a^2+x^2} dx = \frac{1}{a} \tan^{-1} \frac{x}{a} + c$	6	Apr-2018
25	Evaluate $\int_0^{\pi/2} \sin 3x dx$	6	Nov-2018

UNIT-5 APPLICATIONS OF INTEGRATION			
Sl. No.	Questions	Marks	Year
1	Evaluate $\int_0^1 (2x + 1)(x - 3) dx$.	3	Apr-2016
2	Evaluate $\int_0^2 (2 + x)(2 - x) dx$	3	Apr-2019
3	Evaluate $\int_0^4 \frac{1}{16+x^2} dx$	3	Nov-2016
4	Evaluate $\int_0^{\pi/2} \sin x dx$	3	Apr-2017
5	Evaluate $\int_0^{\pi/2} \cos x dx$	3	Apr-2019
6	Evaluate $\int_0^{\pi/2} \cos 4x \sin 2x dx$	5	Apr-2016
7	Evaluate $\int_0^{\pi/2} \cos 5x \cos 3x dx$	5	Nov-2016
8	Evaluate $\int_0^{\pi/2} \sin 3x \cos x dx$	5	Apr-2017/Apr-2019
9	Evaluate $\int_{-\pi/4}^{\pi/4} \cot 2x dx$	5	Nov-2017
10	Evaluate $\int_0^{\pi/2} \sin 4x \cos 2x dx$	5	Nov-2017
11	Find the area bounded by the curve $y = x-5$ at x-axis. The coordinates are $x=0$ and $x=5$.	3	Apr-2016
12	Find the area bounded by the curve $y = 4x^3$ at x-axis. The coordinates are $x=0$ and $x=2$.	3	Apr-2018
13	Find the area bounded by curve $y=3x^2+2x$, x - axis and ordinates $x=0$ and $x=1$.	3	Nov-2018
14	Find the area bounded by the curve $y=4x-x^2-3$ at x-axis. The coordinates are $x=1$ and $x=4$.	5	Nov-2016

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15	Find the area bounded by the curve $y = x^2 + 1$ at x-axis. The coordinates are $x=1$ and $x=3$.	5	Apr-2017/Apr-2019
16	Find the volume generated by rotating the curve $y = \sqrt{x^2 + 5x}$ about x-axis between ordinates $x=1$ and $x=2$	5	Apr-2016
17	Find the volume generated by rotating the curve $y = x+1$ about x-axis between ordinates $x=0$ and $x=2$	5	Nov-2016/Nov-2017/Nov-2018
18	Evaluate $\int_0^{\pi/2} \sin^3 x \, dx$.	6	Apr-2016/ Nov-2016 / Apr-2019
19	Evaluate $\int_0^{\pi/2} \cos^3 x \, dx$	6	Nov-2016/ Apr-2017 Apr-2018

UNIT-6		DIFFERENTIAL EQUATIONS	
Sl. No.	Questions	Ma rks	Year
1	Form a differential equation from $y^2 = 4ax$ by eliminating a.	3	Apr-2016/ Apr-2017 / Apr-2019
2	Solve the differential equation from $x^2 + y^2 = a^2$, where 'a' is parameter.	3	Nov-2016
3	Find the degree & order of differential equation $\frac{dy}{dx} = \sqrt{1 + d^2y/dx^2}$.	3	Apr-2018
4	Solve the differential equation $\frac{dy}{dx} = \frac{1+y^2}{1+x^2}$	5	Apr-2016/ Apr-2019
5	Solve the differential equation $\frac{dy}{dx} + y \tan x = \cos x$	6	Nov-2016/ Nov-2017 \ Apr-2019
6	Eliminate arbitrary constant a & b from the equation $y = a \cos mx + b \sin mx$	5	Apr-2017
7	Solve the differential equation $\frac{dy}{dx} = 3x^2 - 2x + 5$ when $x=1$ & $y=2$	5	Nov-2017
8	Eliminate arbitrary constant a & b from the equation $y = a.e^{2x} + b.e^{-2x}$	5	Apr-2018/ Nov-2017
9	Solve the differential equation, $(1+y)dx + (1+x)dy = 0$	5	Nov-2018
10	Solve the differential equation, $\sec 2x \tan y \, dx + \sec 2y \tan x \, dy = 0$	6	Apr-2016
11	Solve the differential equation $\frac{dy}{dx} = e^{3x+4y}$, given that $y=0$ where $x=0$	6	Nov-2016
12	Solve the differential equation $x(y^2+1)dx + y(x^2+1)dy = 0$	6	Apr-2017
13	Solve the differential equation $\frac{dy}{dx} + \frac{y}{x} = x^2 + 1$	6	Apr-2018
14	Solve the differential equation $\frac{dy}{dx} + 3y = e^{2x}$.	6	Nov-2018