

Seat No.: _____

Enrolment No. _____

GUJARAT TECHNOLOGICAL UNIVERSITY**Diploma Engineering - SEMESTER-II (CtoD) • EXAMINATION – SUMMER • 2014****Subject Code: C320002****Date: 20-06-2014****Subject Name: Advance Mathematics Group - 1****Time: 10:30 am - 12:00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumption wherever necessary.
3. Each question is of 1 mark.
4. Use of SIMPLE CALCULATOR is permissible. (Scientific/Higher Version not allowed)
5. English version is authentic.

No.	Question Text and Option			
1.	Complex number $i =$ _____			
	A.	0	B.	1
	C.	$\sqrt{-1}$	D.	-1
2.	If $z = 1 + i$ then $\bar{z} =$ _____			
	A.	$1 - i$	B.	1
	C.	i	D.	$1 + i$
3.	If $z = 1 + i\sqrt{3}$ then $ z =$ _____			
	A.	1	B.	2
	C.	3	D.	4
4.	If $z = 2 + 2i$ then $\theta =$ _____			
	A.	0	B.	$\frac{\pi}{4}$
	C.	π	D.	2π
5.	$(\cos \theta + i \sin \theta)^n =$ _____			
	A.	$\cos n\theta + i \sin n\theta$	B.	$\cos n\theta - i \sin n\theta$
	C.	1	D.	0
6.	If $z = 3 - 4i$ then $\frac{1}{z} =$ _____			
	A.	$\frac{3 - 4i}{25}$	B.	$\frac{3 + 4i}{25}$
	C.	$\frac{-3 + 4i}{25}$	D.	$\frac{-3 - 4i}{25}$
7.	If $z = 5 - 4i$ then $\text{Im } z =$ _____			
	A.	5	B.	-4
	C.	4	D.	-5
8.	$i + i^2 + i^3 + i^4 + \dots + i^9 =$ _____			
	A.	0	B.	1
	C.	i	D.	$-i$
9.	If $2xi - 3x + iy - 1 = x + 3yi - 2$ then $x =$ _____			
	A.	0	B.	$\frac{1}{4}$
	C.	1	D.	$-\frac{1}{4}$

10.	If $z_1 = 2 + i$, $z_2 = 1 - 2i$ then $\text{Re}(z_1 z_2) =$ _____			
	A.	4	B.	0
	C.	-4	D.	1
11.	If $f(x) = 2x^2 - 2x + 1$ then $f(0) =$ _____			
	A.	2	B.	1
	C.	3	D.	0
12.	If $f(x) = x^2$ and $g(x) = 2x + 1$ then $f \circ g(x) =$ _____			
	A.	$4x^2 + 4x - 1$	B.	$4x^2 + 4x + 1$
	C.	$4x^2 - 4x + 1$	D.	None of above
13.	If $f(x) = \log x$ then $f(xy) =$ _____			
	A.	$f(x)f(y)$	B.	$f(x) + f(y)$
	C.	$f(x) - f(y)$	D.	$f(x) \div f(y)$
14.	$\lim_{x \rightarrow 0} \frac{x^2 + 3x + 2}{5x + 2} =$ _____			
	A.	0	B.	3
	C.	2	D.	1
15.	$\lim_{x \rightarrow -1} \frac{x^2 + 2x + 1}{x + 1} =$ _____			
	A.	1	B.	2
	C.	0	D.	None of above
16.	$\lim_{n \rightarrow \infty} \frac{6n^2 - 3n + 5}{2n^2 + 4n - 3} =$ _____			
	A.	∞	B.	3
	C.	6	D.	0
17.	$\lim_{x \rightarrow 1} \frac{x^{1001} - 1}{x - 1} =$ _____			
	A.	1000	B.	1001
	C.	1	D.	0
18.	$\lim_{x \rightarrow 0} \frac{e^x - \sin x - 1}{x} =$ _____			
	A.	2	B.	1
	C.	0	D.	3
19.	$\lim_{x \rightarrow 0} \frac{4x - 3 \sin x}{2 \tan x - x} =$ _____			
	A.	4	B.	3
	C.	1	D.	0
20.	$\lim_{x \rightarrow 0} \frac{x}{\sqrt{4+x} - 2} =$ _____			
	A.	2	B.	4
	C.	0	D.	None of above
21.	$\lim_{\theta \rightarrow 0} \frac{\sin 4\theta}{\theta} =$ _____			
	A.	0	B.	4
	C.	2	D.	1
22.	$\lim_{h \rightarrow 0} \frac{4^h - 1}{h} =$ _____			

	A.	h	B.	4
	C.	0	D.	$\log_e 4$
23.	$\lim_{x \rightarrow \infty} \left(1 + \frac{5}{x}\right)^x = \underline{\hspace{2cm}}$			
	A.	5	B.	e^5
	C.	0	D.	1
24.	$\lim_{x \rightarrow 0} \frac{5^x - 2^x}{x} = \underline{\hspace{2cm}}$			
	A.	$\log_e \frac{5}{2}$	B.	$\log_e \frac{2}{5}$
	C.	$\log_e 10$	D.	0
25.	$\lim_{x \rightarrow 0} \frac{\sin x^0}{x} = \underline{\hspace{2cm}}$			
	A.	1	B.	0
	C.	x	D.	None of above
26.	$\lim_{n \rightarrow \infty} \frac{2 \sum n}{n^2} = \underline{\hspace{2cm}}$			
	A.	0	B.	2
	C.	1	D.	n
27.	$\lim_{x \rightarrow 0} \frac{\sin 6x}{\tan 3x} = \underline{\hspace{2cm}}$			
	A.	6	B.	1
	C.	2	D.	3
28.	$\lim_{x \rightarrow 1} \left[\frac{1}{x-1} - \frac{2}{x^2-1} \right] = \underline{\hspace{2cm}}$			
	A.	1	B.	2
	C.	$\frac{1}{2}$	D.	0
29.	If $y = x^2 + e^x$ then $\frac{dy}{dx} = \underline{\hspace{2cm}}$			
	A.	1	B.	$x^2 + e^x$
	C.	$2x + e^x$	D.	0
30.	If $y = \cos ec^2 x - \cot^2 x$ then $\frac{dy}{dx} = \underline{\hspace{2cm}}$			
	A.	1	B.	2
	C.	0	D.	None of above
31.	If $f(x) = \frac{\log x}{x}$ then $f'(1) = \underline{\hspace{2cm}}$			
	A.	2	B.	0
	C.	1	D.	None of above
32.	If $y = x^x$ then $\frac{dy}{dx} = \underline{\hspace{2cm}}$			
	A.	$x \square x^{x-1}$	B.	$x^x \log x$
	C.	$x^x (1 + \log x)$	D.	0
33.	If $y = x \sin x$ then $\frac{dy}{dx} = \underline{\hspace{2cm}}$			

	A.	$1 \cos x$	B.	$1 + \cos x$
	C.	$\sin x - x \cos x$	D.	$\sin x + x \cos x$
34.	If $y = x^4 - x^3 + x^2 - x + 1$ then $y_5 =$ _____			
	A.	1	B.	24
	C.	4	D.	0
35.	If $y = r \sin \theta$, $x = r \cos \theta$, r is constant, then $\frac{dy}{dx} =$ _____			
	A.	$\frac{x}{y}$	B.	$-\frac{x}{y}$
	C.	$\frac{y}{x}$	D.	$-\frac{y}{x}$
36.	If $y = \log(\sin x)$ is constant, then $\frac{dy}{dx} =$ _____			
	A.	$\cot x$	B.	$-\cot x$
	C.	$\tan x$	D.	$-\tan x$
37.	If $u = \tan^{-1} x$, $v = \cot^{-1} x$, then $\frac{du}{dv} =$ _____			
	A.	1	B.	-1
	C.	0	D.	None of above
38.	If $y = e^x$, then $y_3 =$ _____			
	A.	x	B.	y
	C.	0	D.	None of above
39.	For function $x^2 + y^2 = 0$, $\frac{dy}{dx} =$ _____			
	A.	$\frac{x}{y}$	B.	$-\frac{x}{y}$
	C.	$\frac{y}{x}$	D.	$-\frac{y}{x}$
40.	If $y = \log\left(\sin \frac{\pi}{2}\right)$, then $\frac{dy}{dx} =$ _____			
	A.	$\cot\left(\frac{\pi}{2}\right)$	B.	$\tan\left(\frac{\pi}{2}\right)$
	C.	$-\cot\left(\frac{\pi}{2}\right)$	D.	None of above
41.	If $y = \log_2 x$, then $\frac{dy}{dx} =$ _____			
	A.	$\frac{1}{x}$	B.	x
	C.	$-\frac{1}{x}$	D.	$\frac{1}{x \log 2}$
42.	Maximum value of function $f(x) = \sin x$ is _____			
	A.	0	B.	1
	C.	-1	D.	10
43.	Function $f(x)$ has minima at point $x = x_1$ If _____			
	A.	$f''(x_1) = 0$	B.	$f''(x_1) < 0$
	C.	$f''(x_1) > 0$	D.	None of above

44.	If equation of motion of a particle is $s(t) = t^3 + 2t^2 - 3t + 5$, velocity at $t = 1$ sec is ____			
	A.	$4 m / \text{sec}$	B.	$10 m / \text{sec}$
	C.	$4 m / \text{sec}^2$	D.	$10 m / \text{sec}^2$
45.	If equation of linear motion of a particle is $s(t) = t^2 - 6t + 7$, velocity $v = 0$ at time $t =$ __			
	A.	7 sec	B.	3 sec
	C.	0 sec	D.	None of above
46.	$\int x^4 dx =$ _____			
	A.	0	B.	x^4
	C.	$4x^3$	D.	None of above
47.	$\int (e^x + 2^x) dx =$ _____			
	A.	$e^x + 2^x$	B.	$e^x + \frac{2^x}{\log_e 2}$
	C.	$e^x + 2^x \log_e 2$	D.	None of above
48.	$\int xe^x dx =$ _____			
	A.	$e^x(x-1) + c$	B.	$e^x(x+1) + c$
	C.	$-e^x(x+1) + c$	D.	$-e^x(x-1) + c$
49.	$\int \frac{1}{1+x^2} dx =$ _____			
	A.	$\cot^{-1} x + c$	B.	$-\tan^{-1} x + c$
	C.	$\sin^{-1} x + c$	D.	$\tan^{-1} x + c$
50.	$\int \frac{1}{x^2-1} dx =$ _____			
	A.	$\frac{1}{2} \log \left \frac{x-1}{x+1} \right $	B.	$\sin^{-1} x + c$
	C.	$-\sin^{-1} x + c$	D.	$\frac{1}{2} \log \left \frac{x+1}{x-1} \right $
51.	$\int \frac{1}{x \log x} dx =$ _____			
	A.	$\log x + c$	B.	$-\log(\log x) + c$
	C.	$\log(\log x) + c$	D.	$\log[\log(\log x)] + c$
52.	$\int e^{4 \log x} dx =$ _____			
	A.	$4x^4 + c$	B.	$\frac{x^4}{4} + c$
	C.	$5x^4 + c$	D.	$\frac{x^5}{5} + c$
53.	$\int_0^1 4x^3 dx =$ _____			
	A.	0	B.	1
	C.	2	D.	3
54.	$\int_{-\pi}^{\pi} (x^5 + \cos ec^3 x) dx =$ _____			
	A.	5	B.	1

	C.	0	D.	3
55.	$\int_0^{\frac{\pi}{2}} \frac{\tan^5 x}{\tan^5 x + \cot^5 x} dx = \underline{\hspace{2cm}}$			
	A.	π	B.	$\frac{\pi}{2}$
	C.	$\frac{\pi}{4}$	D.	$\frac{\pi}{8}$
56.	$\int_1^7 \frac{\sqrt{8-x}}{\sqrt{x} + \sqrt{8-x}} dx = \underline{\hspace{2cm}}$			
	A.	1	B.	2
	C.	0	D.	3
57.	$\int \frac{e^x}{e^{2x} + 1} dx = \underline{\hspace{2cm}}$			
	A.	$\tan^{-1} x + c$	B.	$-\tan^{-1} x + c$
	C.	$\tan^{-1}(e^x) + c$	D.	$-\tan^{-1}(e^x) + c$
58.	$\int \frac{e^x - e^{-x}}{e^x + e^{-x}} dx = \underline{\hspace{2cm}}$			
	A.	$\log(e^x - e^{-x}) + c$	B.	$\log(e^x + e^{-x}) + c$
	C.	$-\log(e^x - e^{-x}) + c$	D.	$-\log(e^x + e^{-x}) + c$
59.	Area of region bounded by $x = 0$, $x = 2$, $y = x$ and X - axis is $\underline{\hspace{2cm}}$			
	A.	0 unit	B.	1 unit
	C.	2 unit	D.	3 unit
60.	Volume of solid generated by revolving region bounded by $x = f_1(y)$ and $x = f_2(y)$ around Y - axis is $V = I $ where $I = \underline{\hspace{2cm}}$			
	A.	$\pi \int [\{f_1(y)\}^2 + \{f_2(y)\}^2] dy$ unit	B.	$-\pi \int [\{f_1(y)\}^2 - \{f_2(y)\}^2] dy$ unit
	C.	$-\pi \int [\{f_1(y)\}^2 + \{f_2(y)\}^2] dy$ unit	D.	$\pi \int [\{f_1(y)\}^2 - \{f_2(y)\}^2] dy$ unit
61.	Order of differential equation $\frac{d^3 y}{dx^3} + x \frac{d^2 y}{dx^2} + x \frac{dy}{dx} + y = 0$ is $\underline{\hspace{2cm}}$			
	A.	0	B.	3
	C.	2	D.	1
62.	Degree of differential equation $\left(\frac{d^2 y}{dx^2}\right)^2 + \left(\frac{dy}{dx}\right)^3 = 0$ is $\underline{\hspace{2cm}}$			
	A.	0	B.	3
	C.	2	D.	1
63.	Differential equation of all straight lines $y = mx + c$ is $\underline{\hspace{2cm}}$			
	A.	$\frac{dy}{dx} = 0$	B.	$m \frac{d^2 y}{dx^2} = 0$
	C.	$c \frac{dy}{dx} = 0$	D.	$\frac{d^2 y}{dx^2} = 0$
64.	Differential equation of circle $x^2 + y^2 = r^2$, r constant is $\underline{\hspace{2cm}}$			
	A.	$x + y \frac{dy}{dx} = 0$	B.	$x - y \frac{dy}{dx} = 0$

	C.	$-x - y \frac{dy}{dx} = 0$	D.	$-x + y \frac{dy}{dx} = 0$
65.	Differential equation of $y = ae^{2x} + be^{-2x}$, is _____			
	A.	$\frac{d^2y}{dx^2} + 4y = 0$	B.	$\frac{d^2y}{dx^2} - 4y = 0$
	C.	$-\frac{d^2y}{dx^2} + 4y = 0$	D.	None of above
66.	Solution of differential equation $\frac{d^2y}{dx^2} + y = 0$ is _____			
	A.	$y = \sin x + \cos x$	B.	$y = \sin x$
	C.	$y = \cos x$	D.	None of above
67.	Solution of differential equation $\frac{dy}{dx} + Py = Q$ is _____			
	A.	$y(I.F) = \int [Q \cdot I.F] dx + c$	B.	$y(I.F) = -\int [Q \cdot I.F] dx + c$
	C.	$y(P.F) = \int [Q \cdot P.F] dx + c$	D.	None of above
68.	For differential equation $\frac{dy}{dx} + Py = Q$, $I.F =$ _____			
	A.	$e^{-\int P dx}$	B.	$e^{\int P dx}$
	C.	$e^{\int Q dx}$	D.	None of above
69.	Solution of differential equation $x dx + y dy = 0$ is _____			
	A.	$x^2 + y^2 = c$	B.	$x^2 - y^2 = c$
	C.	$x^2 \cdot y^2 = c$	D.	None of above
70.	Solution of differential equation $y dx + x dy = 0$ is _____			
	A.	$x^2 + y^2 = c$	B.	$x^2 - y^2 = c$
	C.	$x^2 \cdot y^2 = c$	D.	$x \cdot y = c$

ગુજરાતી

નં.	પ્રશ્ન તેમજ વિકલ્પ			
૧.	સંકર સંખ્યા $i =$ _____			
	A.	0	B.	1
	C.	$\sqrt{-1}$	D.	-1
૨.	જો $z = 1 + i$ તો $\bar{z} =$ _____			
	A.	$1 - i$	B.	1
	C.	i	D.	$1 + i$
૩.	જો $z = 1 + i\sqrt{3}$ તો $ z =$ _____			
	A.	1	B.	2
	C.	3	D.	4
૪.	જો $z = 2 + 2i$ તો $\theta =$ _____			
	A.	0	B.	$\frac{\pi}{4}$

	C.	π	D.	2π
૫.	$(\cos \theta + i \sin \theta)^n = \underline{\hspace{2cm}}$			
	A.	$\cos n\theta + i \sin n\theta$	B.	$\cos n\theta - i \sin n\theta$
	C.	1	D.	0
૬.	જો $z = 3 - 4i$ તો $\frac{1}{z} = \underline{\hspace{2cm}}$			
	A.	$\frac{3-4i}{25}$	B.	$\frac{3+4i}{25}$
	C.	$\frac{-3+4i}{25}$	D.	$\frac{-3-4i}{25}$
૭.	જો $z = 5 - 4i$ તો $\text{Im } z = \underline{\hspace{2cm}}$			
	A.	5	B.	-4
	C.	4	D.	-5
૮.	$i + i^2 + i^3 + i^4 + \dots + i^9 = \underline{\hspace{2cm}}$			
	A.	0	B.	1
	C.	i	D.	-i
૯.	જો $2xi - 3x + iy - 1 = x + 3yi - 2$ તો $x = \underline{\hspace{2cm}}$			
	A.	0	B.	$\frac{1}{4}$
	C.	1	D.	$-\frac{1}{4}$
૧૦.	જો $z_1 = 2 + i, z_2 = 1 - 2i$ તો $\text{Re}(z_1 z_2) = \underline{\hspace{2cm}}$			
	A.	4	B.	0
	C.	-4	D.	1
૧૧.	જો $f(x) = 2x^2 - 2x + 1$ તો $f(0) = \underline{\hspace{2cm}}$			
	A.	2	B.	1
	C.	3	D.	0
૧૨.	જો $f(x) = x^2$ and $g(x) = 2x + 1$ તો $f \circ g(x) = \underline{\hspace{2cm}}$			
	A.	$4x^2 + 4x - 1$	B.	$4x^2 + 4x + 1$
	C.	$4x^2 - 4x + 1$	D.	ઉપરમાંથી કોઈ પણ નહી
૧૩.	જો $f(x) = \log x$ તો $f(xy) = \underline{\hspace{2cm}}$			
	A.	$f(x)f(y)$	B.	$f(x) + f(y)$
	C.	$f(x) - f(y)$	D.	$f(x) \div f(y)$
૧૪.	$\lim_{x \rightarrow 0} \frac{x^2 + 3x + 2}{5x + 2} = \underline{\hspace{2cm}}$			
	A.	0	B.	3
	C.	2	D.	1
૧૫.	$\lim_{x \rightarrow -1} \frac{x^2 + 2x + 1}{x + 1} = \underline{\hspace{2cm}}$			
	A.	1	B.	2
	C.	0	D.	ઉપરમાંથી કોઈ પણ નહી
૧૬.	$\lim_{n \rightarrow \infty} \frac{6n^2 - 3n + 5}{2n^2 + 4n - 3} = \underline{\hspace{2cm}}$			
	A.	∞	B.	2

	C.	6	D.	0
૧૭.	$\lim_{x \rightarrow 1} \frac{x^{1001} - 1}{x - 1} = \underline{\hspace{2cm}}$			
	A.	1000	B.	1001
	C.	1	D.	0
૧૮.	$\lim_{x \rightarrow 0} \frac{e^x - \sin x - 1}{x} = \underline{\hspace{2cm}}$			
	A.	2	B.	1
	C.	0	D.	3
૧૯.	$\lim_{x \rightarrow 0} \frac{4x - 3 \sin x}{2 \tan x - x} = \underline{\hspace{2cm}}$			
	A.	4	B.	3
	C.	1	D.	0
૨૦.	$\lim_{x \rightarrow 0} \frac{x}{\sqrt{4+x} - 2} = \underline{\hspace{2cm}}$			
	A.	2	B.	4
	C.	0	D.	ઉપરમાંથી કોઈ પણ નહી
૨૧.	$\lim_{\theta \rightarrow 0} \frac{\sin 4\theta}{\theta} = \underline{\hspace{2cm}}$			
	A.	0	B.	4
	C.	2	D.	1
૨૨.	$\lim_{h \rightarrow 0} \frac{4^h - 1}{h} = \underline{\hspace{2cm}}$			
	A.	h	B.	4
	C.	0	D.	$\log_e 4$
૨૩.	$\lim_{x \rightarrow \infty} \left(1 + \frac{5}{x}\right)^x = \underline{\hspace{2cm}}$			
	A.	5	B.	e^5
	C.	0	D.	1
૨૪.	$\lim_{x \rightarrow 0} \frac{5^x - 2^x}{x} = \underline{\hspace{2cm}}$			
	A.	$\log_e \frac{5}{2}$	B.	$\log_e \frac{2}{5}$
	C.	$\log_e 10$	D.	0
૨૫.	$\lim_{x \rightarrow 0} \frac{\sin x^0}{x} = \underline{\hspace{2cm}}$			
	A.	1	B.	0
	C.	x	D.	ઉપરમાંથી કોઈ પણ નહી
૨૬.	$\lim_{n \rightarrow \infty} \frac{2 \sum n}{n^2} = \underline{\hspace{2cm}}$			
	A.	0	B.	2
	C.	1	D.	n
૨૭.	$\lim_{x \rightarrow 0} \frac{\sin 6x}{\tan 3x} = \underline{\hspace{2cm}}$			
	A.	6	B.	1

	C.	2	D.	3
૨૮.	$\lim_{x \rightarrow 1} \left[\frac{1}{x-1} - \frac{2}{x^2-1} \right] = \underline{\hspace{2cm}}$			
	A.	1	B.	2
	C.	$\frac{1}{2}$	D.	0
૨૯.	જો $y = x^2 + e^x$ તો $\frac{dy}{dx} = \underline{\hspace{2cm}}$			
	A.	1	B.	$x^2 + e^x$
	C.	$2x + e^x$	D.	0
૩૦.	જો $y = \cos ec^2 x - \cot^2 x$ તો $\frac{dy}{dx} = \underline{\hspace{2cm}}$			
	A.	1	B.	2
	C.	0	D.	ઉપરમાંથી કોઈ પણ નહી
૩૧.	જો $f(x) = \frac{\log x}{x}$ તો $f'(1) = \underline{\hspace{2cm}}$			
	A.	2	B.	0
	C.	1	D.	ઉપરમાંથી કોઈ પણ નહી
૩૨.	જો $y = x^x$ તો $\frac{dy}{dx} = \underline{\hspace{2cm}}$			
	A.	$x \log x^{x-1}$	B.	$x^x \log x$
	C.	$x^x (1 + \log x)$	D.	0
૩૩.	જો $y = x \sin x$ તો $\frac{dy}{dx} = \underline{\hspace{2cm}}$			
	A.	$1 \cos x$	B.	$1 + \cos x$
	C.	$\sin x - x \cos x$	D.	$\sin x + x \cos x$
૩૪.	જો $y = x^4 - x^3 + x^2 - x + 1$ તો $y_5 = \underline{\hspace{2cm}}$			
	A.	1	B.	24
	C.	4	D.	0
૩૫.	જો $y = r \sin \theta$, $x = r \cos \theta$, r અચળ છે, તો $\frac{dy}{dx} = \underline{\hspace{2cm}}$			
	A.	$\frac{x}{y}$	B.	$-\frac{x}{y}$
	C.	$\frac{y}{x}$	D.	$-\frac{y}{x}$
૩૬.	જો $y = \log(\sin x)$, તો $\frac{dy}{dx} = \underline{\hspace{2cm}}$			
	A.	$\cot x$	B.	$-\cot x$
	C.	$\tan x$	D.	$-\tan x$
૩૭.	જો $u = \tan^{-1} x$, $v = \cot^{-1} x$, તો $\frac{du}{dv} = \underline{\hspace{2cm}}$			
	A.	1	B.	-1
	C.	0	D.	ઉપરમાંથી કોઈ પણ નહી
૩૮.	જો $y = e^x$, તો $y_3 = \underline{\hspace{2cm}}$			
	A.	x	B.	y

	C.	0	D.	ઉપરમાંથી કોઈ પણ નહી
૩૯.	વિધેય $x^2 + y^2 = 0$ માટે $\frac{dy}{dx} =$ _____			
	A.	$\frac{x}{y}$	B.	$-\frac{x}{y}$
	C.	$\frac{y}{x}$	D.	$-\frac{y}{x}$
૪૦.	જો $y = \log\left(\sin \frac{\pi}{2}\right)$, તો $\frac{dy}{dx} =$ _____			
	A.	$\cot\left(\frac{\pi}{2}\right)$	B.	$\tan\left(\frac{\pi}{2}\right)$
	C.	$-\cot\left(\frac{\pi}{2}\right)$	D.	ઉપરમાંથી કોઈ પણ નહી
૪૧.	જો $y = \log_2 x$, તો $\frac{dy}{dx} =$ _____			
	A.	$\frac{1}{x}$	B.	x
	C.	$-\frac{1}{x}$	D.	$\frac{1}{x \log 2}$
૪૨.	વિધેય $f(x) = \sin x$ ની મહત્તમ કિંમત _____			
	A.	0	B.	1
	C.	-1	D.	10
૪૩.	વિધેય $f(x)$ ની બિંદુ $x = x_1$ આગળની ન્યુનતમ કિંમત માટે _____ હોય.			
	A.	$f''(x_1) = 0$	B.	$f''(x_1) < 0$
	C.	$f''(x_1) > 0$	D.	ઉપરમાંથી કોઈ પણ નહી
૪૪.	જો પદાર્થના ગતિનું સમીકરણ $s(t) = t^3 + 2t^2 - 3t + 5$ હોય, તો $t = 1$ sec આગળ વેગ _____			
	A.	$4 m / \text{sec}$	B.	$10 m / \text{sec}$
	C.	$4 m / \text{sec}^2$	D.	$10 m / \text{sec}^2$
૪૫.	જો પદાર્થના ગતિનું સમીકરણ $s(t) = t^2 - 6t + 7$, વેગ $v = 0$ હોય ત્યારે સમય $t =$ _____			
	A.	7 sec	B.	3 sec
	C.	0 sec	D.	ઉપરમાંથી કોઈ પણ નહી
૪૬.	$\int x^4 dx =$ _____			
	A.	0	B.	x^4
	C.	$4x^3$	D.	ઉપરમાંથી કોઈ પણ નહી
૪૭.	$\int (e^x + 2^x) dx =$ _____			
	A.	$e^x + 2^x$	B.	$e^x + \frac{2^x}{\log_e 2}$
	C.	$e^x + 2^x \log_e 2$	D.	ઉપરમાંથી કોઈ પણ નહી
૪૮.	$\int x e^x dx =$ _____			
	A.	$e^x(x-1) + c$	B.	$e^x(x+1) + c$

	C.	$-e^x(x+1)+c$	D.	$-e^x(x-1)+c$
39.	$\int \frac{1}{1+x^2} dx = \underline{\hspace{2cm}}$			
	A.	$\cot^{-1} x + c$	B.	$-\tan^{-1} x + c$
	C.	$\sin^{-1} x + c$	D.	$\tan^{-1} x + c$
40.	$\int \frac{1}{x^2-1} dx = \underline{\hspace{2cm}}$			
	A.	$\frac{1}{2} \log \left \frac{x-1}{x+1} \right $	B.	$\sin^{-1} x + c$
	C.	$-\sin^{-1} x + c$	D.	$\frac{1}{2} \log \left \frac{x+1}{x-1} \right $
41.	$\int \frac{1}{x \log x} dx = \underline{\hspace{2cm}}$			
	A.	$\log x + c$	B.	$-\log(\log x) + c$
	C.	$\log(\log x) + c$	D.	$\log[\log(\log x)] + c$
42.	$\int e^{4 \log x} dx = \underline{\hspace{2cm}}$			
	A.	$4x^4 + c$	B.	$\frac{x^4}{4} + c$
	C.	$5x^4 + c$	D.	$x^5/5 + c$
43.	$\int_0^1 4x^3 dx = \underline{\hspace{2cm}}$			
	A.	0	B.	1
	C.	2	D.	3
44.	$\int_{-\pi}^{\pi} (x^5 + \cos ec^3 x) dx = \underline{\hspace{2cm}}$			
	A.	5	B.	1
	C.	0	D.	3
45.	$\int_0^{\frac{\pi}{2}} \frac{\tan^5 x}{\tan^5 x + \cot^5 x} dx = \underline{\hspace{2cm}}$			
	A.	π	B.	$\frac{\pi}{2}$
	C.	$\frac{\pi}{4}$	D.	$\frac{\pi}{8}$
46.	$\int_1^7 \frac{\sqrt{8-x}}{\sqrt{x} + \sqrt{8-x}} dx = \underline{\hspace{2cm}}$			
	A.	1	B.	2
	C.	0	D.	3
47.	$\int \frac{e^x}{e^{2x} + 1} dx = \underline{\hspace{2cm}}$			
	A.	$\tan^{-1} x + c$	B.	$-\tan^{-1} x + c$
	C.	$\tan^{-1}(e^x) + c$	D.	$-\tan^{-1}(e^x) + c$

૫૮.	$\int \frac{e^x - e^{-x}}{e^x + e^{-x}} dx = \underline{\hspace{2cm}}$			
	A.	$\log(e^x - e^{-x}) + c$	B.	$\log(e^x + e^{-x}) + c$
	C.	$-\log(e^x - e^{-x}) + c$	D.	$-\log(e^x + e^{-x}) + c$
૫૯.	$x=0, x=2, y=x$ અને X -અક્ષ થી ઘેરાયેલા પ્રદેશનું ક્ષેત્રફળ _____ છે.			
	A.	0 એકમ	B.	1 એકમ
	C.	2 એકમ	D.	3 એકમ
૬૦.	$x = f_1(y)$ અને $x = f_2(y)$ થી ઘેરાયેલા પ્રદેશને Y -અક્ષની આજુબાજુ ધુમાવતા બનતા ઘન પદાર્થનું ઘનફળ $V = I $ જ્યાં $I = \underline{\hspace{2cm}}$			
	A.	$\pi \int [\{f_1(y)\}^2 + \{f_2(y)\}^2] dy$ એકમ	B.	$-\pi \int [\{f_1(y)\}^2 - \{f_2(y)\}^2] dy$ એકમ
	C.	$-\pi \int [\{f_1(y)\}^2 + \{f_2(y)\}^2] dy$ એકમ	D.	$\pi \int [\{f_1(y)\}^2 - \{f_2(y)\}^2] dy$ એકમ
૬૧.	વિકલ સમીકરણ $\frac{d^3y}{dx^3} + x \frac{d^2y}{dx^2} + x \frac{dy}{dx} + y = 0$ ની કક્ષા _____			
	A.	0	B.	3
	C.	2	D.	1
૬૨.	વિકલ સમીકરણ $\left(\frac{d^2y}{dx^2}\right)^2 + \left(\frac{dy}{dx}\right)^3 = 0$ નું પરિમાણ _____ છે.			
	A.	0	B.	3
	C.	2	D.	1
૬૩.	રેખા સંહતિ $y = mx + c$ નું વિકલ સમીકરણ _____ છે.			
	A.	$\frac{dy}{dx} = 0$	B.	$m \frac{d^2y}{dx^2} = 0$
	C.	$c \frac{dy}{dx} = 0$	D.	$\frac{d^2y}{dx^2} = 0$
૬૪.	વર્તુળ $x^2 + y^2 = r^2, r$ અચળ નું વિકલ સમીકરણ _____ છે.			
	A.	$x + y \frac{dy}{dx} = 0$	B.	$x - y \frac{dy}{dx} = 0$
	C.	$-x - y \frac{dy}{dx} = 0$	D.	$-x + y \frac{dy}{dx} = 0$
૬૫.	વિધેય $y = ae^{2x} + be^{-2x}$ વિકલ સમીકરણ _____ છે.			
	A.	$\frac{d^2y}{dx^2} + 4y = 0$	B.	$\frac{d^2y}{dx^2} - 4y = 0$
	C.	$-\frac{d^2y}{dx^2} + 4y = 0$	D.	ઉપરમાંથી કોઈ પણ નહી
૬૬.	વિકલ સમીકરણ $\frac{d^2y}{dx^2} + y = 0$ નો ઉકેલ _____ છે.			
	A.	$y = \sin x + \cos x$	B.	$y = \sin x$
	C.	$y = \cos x$	D.	ઉપરમાંથી કોઈ પણ નહી

૬૭.	વિકલ સમીકરણ $\frac{dy}{dx} + Py = Q$ નો ઉકેલ _____ છે.			
	A.	$y(I.F) = \int [Q \cdot I.F] dx + c$	B.	$y(I.F) = -\int [Q \cdot I.F] dx + c$
	C.	$y(P.F) = \int [Q \cdot P.F] dx + c$	D.	ઉપરમાંથી કોઈ પણ નહી
૬૮.	વિકલ સમીકરણ $\frac{dy}{dx} + Py = Q$ માટે $I.F =$ _____ છે.			
	A.	$e^{-\int P dx}$	B.	$e^{\int P dx}$
	C.	$e^{\int Q dx}$	D.	ઉપરમાંથી કોઈ પણ નહી
૬૯.	વિકલ સમીકરણ $x dx + y dy = 0$ નો ઉકેલ _____ છે.			
	A.	$x^2 + y^2 = c$	B.	$x^2 - y^2 = c$
	C.	$x^2 \cdot y^2 = c$	D.	ઉપરમાંથી કોઈ પણ નહી
૭૦.	વિકલ સમીકરણ $y dx + x dy = 0$ નો ઉકેલ _____ છે.			
	A.	$x^2 + y^2 = c$	B.	$x^2 - y^2 = c$
	C.	$x^2 \cdot y^2 = c$	D.	$x \cdot y = c$
