

GUJARAT TECHNOLOGICAL UNIVERSITY

DIPLOMA ENGINEERING – SEMESTER-C to D Bridge Course EXAMINATION – Winter- 2019

Subject Code: C320002**Date: 27-12-2019****Subject Name: ADVANCED MATHEMATICS (GROUP-1)****Time: 10:30 AM TO 12:00 PM****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make Suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Use of programmable & Communication aids are strictly prohibited.
5. Use of only simple calculator is permitted in Mathematics.
6. English version is authentic.

No. Question Text and Option. પ્રશ્ન અને વિકલ્પો.

1. $\frac{1}{i} = \underline{\hspace{2cm}}$.
- A. $-i$ B. 1
C. -1 D. i
૧. $\frac{1}{i} = \underline{\hspace{2cm}}$.
- A. $-i$ B. 1
C. -1 D. i
2. If $Z = -3 - 4i$ then $\bar{Z} = \underline{\hspace{2cm}}$.
- A. $3 + 4i$ B. $3 - 4i$
C. $-3 + 4i$ D. None of these
૨. જો $Z = -3 - 4i$ તો $\bar{Z} = \underline{\hspace{2cm}}$.
- A. $3 + 4i$ B. $3 - 4i$
C. $-3 + 4i$ D. કોઈપણ નહીં
3. If $z = 2 + 3i$ then $z^{-1} = \underline{\hspace{2cm}}$.
- A. $\frac{2}{13} + \frac{3}{13}i$ B. $\frac{2}{13} - \frac{3}{13}i$
C. $\frac{2}{\sqrt{13}} + \frac{3}{\sqrt{13}}i$ D. $\frac{2}{\sqrt{13}} - \frac{3}{\sqrt{13}}i$
૩. જો $z = 2 + 3i$ તો $z^{-1} = \underline{\hspace{2cm}}$.
- A. $\frac{2}{13} + \frac{3}{13}i$ B. $\frac{2}{13} - \frac{3}{13}i$
C. $\frac{2}{\sqrt{13}} + \frac{3}{\sqrt{13}}i$ D. $\frac{2}{\sqrt{13}} - \frac{3}{\sqrt{13}}i$
4. For any complex number $Z \in \mathbb{C}$, $Z + \bar{Z} = \underline{\hspace{2cm}}$.
- A. $\text{Re}(Z)$ B. $\text{Im}(Z)$
C. $2\text{Re}(Z)$ D. $2\text{Im}(Z)$
૪. કોઈપણ સંકર સંખ્યા $Z \in \mathbb{C}$, માટે $Z + \bar{Z} = \underline{\hspace{2cm}}$.
- A. $\text{Re}(Z)$ B. $\text{Im}(Z)$
C. $2\text{Re}(Z)$ D. $2\text{Im}(Z)$
5. For any complex number $Z \in \mathbb{C}$, $Z\bar{Z} = \underline{\hspace{2cm}}$.
- A. $|Z|^2$ B. Z^2
C. $(\bar{Z})^{-2}$ D. $|Z|$
૫. કોઈપણ સંકર સંખ્યા $Z \in \mathbb{C}$, માટે $Z\bar{Z} = \underline{\hspace{2cm}}$.

- A. $|Z|^2$ B. Z^2
C. $(\bar{Z})^{-2}$ D. $|Z|$

If $Z = 1 - i\sqrt{3}$ then principal argument of $Z =$ _____.

6. A. $\frac{\pi}{3}$ B. $\frac{\pi}{6}$
C. $-\frac{\pi}{3}$ D. $-\frac{\pi}{6}$

જો $Z = 1 - i\sqrt{3}$ તો Z નું મુખ્ય કોણ = _____.

૬. A. $\frac{\pi}{3}$ B. $\frac{\pi}{6}$
C. $-\frac{\pi}{3}$ D. $-\frac{\pi}{6}$

Square root of the complex number $-i =$ _____.

7. A. $\frac{1}{\sqrt{2}}(1 + i)$ B. $\frac{1}{\sqrt{2}}(1 - i)$
C. $\pm \frac{1}{\sqrt{2}}(1 + i)$ D. $\pm \frac{1}{\sqrt{2}}(1 - i)$

સંકર સંખ્યા $-i$ નું વર્ગમૂળ = _____.

૭. A. $\frac{1}{\sqrt{2}}(1 + i)$ B. $\frac{1}{\sqrt{2}}(1 - i)$
C. $\pm \frac{1}{\sqrt{2}}(1 + i)$ D. $\pm \frac{1}{\sqrt{2}}(1 - i)$

If $-3x + 2yi = 6 - 8i$ then $x =$ _____ and $y =$ _____.

8. A. $-2, 4$ B. $-2, -4$
C. $2, 4$ D. $2, -4$

જો $-3x + 2yi = 6 - 8i$ તો $x =$ _____ અને $y =$ _____.

૮. A. $-2, 4$ B. $-2, -4$
C. $2, 4$ D. $2, -4$

$(\cos \theta + i \sin \theta)^{-3} =$ _____.

9. A. $\cos 3\theta + i \sin 3\theta$ B. $\cos^3 \theta - i \sin^3 \theta$
C. $\cos 3\theta - i \sin 3\theta$ D. $3\cos \theta - i 3\sin \theta$

$(\cos \theta + i \sin \theta)^{-3} =$ _____.

૯. A. $\cos 3\theta + i \sin 3\theta$ B. $\cos^3 \theta - i \sin^3 \theta$
C. $\cos 3\theta - i \sin 3\theta$ D. $3\cos \theta - i 3\sin \theta$

if $Z = \cos \theta + i \sin \theta$, then $|Z| =$ _____

10. A. -1 B. $\cos \theta + \sin \theta$
C. $2\cos^2 \theta$ D. 1

if $Z = \cos \theta + i \sin \theta$, then $|Z| =$ _____

૧૦. A. -1 B. $\cos \theta + \sin \theta$
C. $2\cos^2 \theta$ D. 1

$\lim_{x \rightarrow 2} \frac{x^3 + 5}{5x + 3} =$ _____

11. A. $13/7$ B. 1
C. $3/4$ D. $7/13$

$\lim_{x \rightarrow 2} \frac{x^3 + 5}{5x + 3} =$ _____

૧૧. A. $13/7$ B. 1
C. $3/4$ D. $7/13$

$\lim_{x \rightarrow -1} \frac{x^{15} + 1}{x + 1} =$ _____.

12. A. 15 B. 14
C. 0 D. 1

$\lim_{x \rightarrow -1} \frac{x^{15} + 1}{x + 1} =$ _____.

૧૨. A. 15 B. 14
C. 0 D. 1

13. $\lim_{n \rightarrow \infty} \frac{5n+4}{4n+5} = \underline{\hspace{2cm}}$.
 A. $\frac{4}{5}$ B. $\frac{5}{4}$
 C. 0 D. 1
13. $\lim_{n \rightarrow \infty} \frac{5n+4}{4n+5} = \underline{\hspace{2cm}}$.
 A. $\frac{4}{5}$ B. $\frac{5}{4}$
 C. 0 D. 1
14. $\lim_{x \rightarrow \infty} \left(1 - \frac{1}{x}\right)^x = \underline{\hspace{2cm}}$
 A. e B. e^{-1}
 C. 1 D. 0
14. $\lim_{x \rightarrow \infty} \left(1 - \frac{1}{x}\right)^x = \underline{\hspace{2cm}}$
 A. e B. e^{-1}
 C. 1 D. 0
15. $\lim_{x \rightarrow 0} \frac{x}{\tan 7x} = \underline{\hspace{2cm}}$
 A. $\frac{1}{7}$ B. 7
 C. 0 D. 1
15. $\lim_{x \rightarrow 0} \frac{x}{\tan 7x} = \underline{\hspace{2cm}}$
 A. $\frac{1}{7}$ B. 7
 C. 0 D. 1
16. $\lim_{x \rightarrow 0} \frac{5^x - 3^x}{x} = \underline{\hspace{2cm}}$
 A. $\log \frac{5}{3}$ B. $\log \frac{3}{5}$
 C. $\log 8$ D. $\log 15$
16. $\lim_{x \rightarrow 0} \frac{5^x - 3^x}{x} = \underline{\hspace{2cm}}$
 A. $\log \frac{5}{3}$ B. $\log \frac{3}{5}$
 C. $\log 8$ D. $\log 15$
17. If $f(x) = a^x$, then $f(x+y) = \underline{\hspace{2cm}}$
 A. $f(x) \cdot f(y)$ B. $f(x) - f(y)$
 C. $f(x) + f(y)$ D. $f(x) \div f(y)$
17. If $f(x) = a^x$, then $f(x+y) = \underline{\hspace{2cm}}$
 A. $f(x) \cdot f(y)$ B. $f(x) - f(y)$
 C. $f(x) + f(y)$ D. $f(x) \div f(y)$
18. If $f(x) = \cos x$, then $f(\pi + x) = \underline{\hspace{2cm}}$
 A. $\cos x$ B. $\sin x$
 C. $-\cos x$ D. $-\sin x$
18. If $f(x) = \cos x$, then $f(\pi + x) = \underline{\hspace{2cm}}$
 A. $\cos x$ B. $\sin x$
 C. $-\cos x$ D. $-\sin x$
19. If $f(x) = 4x^3 + 2x^2 - 7x - 2$, then $f(-1) = \underline{\hspace{2cm}}$
 A. -1 B. 1
 C. 0 D. 3
19. If $f(x) = 4x^3 + 2x^2 - 7x - 2$, then $f(-1) = \underline{\hspace{2cm}}$.
 A. -1 B. 1
 C. 0 D. 3
20. If $f(x) = \sin x$, $g(x) = \cos x$ then $2f(x)(gx) = \underline{\hspace{2cm}}$
 A. $g(2x)$ B. $[f(x)]^2$
 C. $f(2x)$ D. $[g(x)]$

20. If $f(x) = \sin x$, $g(x) = \cos x$ then $2f(x)(gx) =$ _____
 A. $\frac{g(2x)}{f(2x)}$ B. $[f(x)]^2$
 C. $\frac{f(2x)}{g(x)}$ D. $[g(x)]$
21. If $f(x) = \frac{x-1}{x+1}$ then $f\left(\frac{1}{x}\right) =$ _____
 A. $\frac{x+1}{x-1}$ B. $\frac{1-x}{1+x}$
 C. $\frac{x-1}{x+1}$ D. $\frac{1+x}{1-x}$
22. If $f(x) = \log x$ then $f\left(\frac{x}{y}\right) =$ _____
 A. $\frac{x+1}{x-1}$ B. $\frac{1-x}{1+x}$
 C. $\frac{x-1}{x+1}$ D. $\frac{1+x}{1-x}$
23. If $f(x) = \log x$ then $f\left(\frac{x}{y}\right) =$ _____
 A. $\frac{f(x) - f(y)}{f(x) \times f(y)}$ B. $\frac{f(x) \div f(y)}{f(x) + f(y)}$
 C. $\frac{f(x) - f(y)}{f(x) \times f(y)}$ D. $\frac{f(x) \div f(y)}{f(x) + f(y)}$
24. $\frac{d}{dx}(u \cdot v) =$ _____
 A. $\frac{du}{dx} \cdot \frac{dv}{dx}$ B. $\frac{du}{dx} + \frac{dv}{dx}$
 C. $u \frac{dv}{dx} \times v \frac{du}{dx}$ D. $u \frac{dv}{dx} + v \frac{du}{dx}$
25. $\frac{d}{dx}(u \cdot v) =$ _____
 A. $\frac{du}{dx} \cdot \frac{dv}{dx}$ B. $\frac{du}{dx} + \frac{dv}{dx}$
 C. $u \frac{dv}{dx} \times v \frac{du}{dx}$ D. $u \frac{dv}{dx} + v \frac{du}{dx}$
26. $\frac{d}{dx}\left(\frac{1}{x}\right) =$ _____
 A. $-x^{-2}$ B. x^{-2}
 C. $-x^2$ D. $\log|x|$
27. $\frac{d}{dx}\left(\frac{1}{x}\right) =$ _____
 A. $-x^{-2}$ B. x^{-2}
 C. $-x^2$ D. $\log|x|$
28. $\frac{d}{dx}(\log x^2) =$ _____
 A. $1/x^2$ B. $2/x$
 C. $2x$ D. $1/x$
29. $\frac{d}{dx}(\log x^2) =$ _____
 A. $1/x^2$ B. $2/x$
 C. $2x$ D. $1/x$

26. If $x^2 - y^2 = 1$ then $\frac{dy}{dx} =$ _____
 A. $\frac{y}{x}$ B. $-\frac{x}{y}$
 C. $-\frac{y}{x}$ D. $\frac{x}{y}$
27. If $x^2 - y^2 = 1$ then $\frac{dy}{dx} =$ _____
 A. $\frac{y}{x}$ B. $-\frac{x}{y}$
 C. $-\frac{y}{x}$ D. $\frac{x}{y}$
28. $\frac{d}{dx}(\tan^{-1} \theta + \cot^{-1} \theta) =$ _____.
 A. 0 B. -1
 C. 1 D. $\pi/2$
29. $\frac{d}{dx}(\tan^{-1} \theta + \cot^{-1} \theta) =$ _____.
 A. 0 B. -1
 C. 1 D. $\pi/2$
30. If $f(x) = 5^x$ then $f'(x) =$ _____.
 A. $5^x \log x$ B. $x 5^{x-1}$
 C. $5^x \log 5$ D. $5x^4$
31. If $f(x) = 5^x$ then $f'(x) =$ _____.
 A. $5^x \log x$ B. $x 5^{x-1}$
 C. $5^x \log 5$ D. $5x^4$
32. $\frac{d}{dx}(\log \sec x) =$ _____.
 A. $\sec x$ B. $\tan x$
 C. $\cos x$ D. $\sec x \tan x$
33. $\frac{d}{dx}(\log \sec x) =$ _____.
 A. $\sec x$ B. $\tan x$
 C. $\cos x$ D. $\sec x \tan x$
34. If $y = e^x - e^{-x}$ then $\frac{d^2y}{dx^2} =$ _____.
 A. $e^x + e^{-x}$ B. $-e^x - e^{-x}$
 C. $e^x - e^{-x}$ D. $-e^x + e^{-x}$
35. If $y = e^x - e^{-x}$ then $\frac{d^2y}{dx^2} =$ _____.
 A. $e^x + e^{-x}$ B. $-e^x - e^{-x}$
 C. $e^x - e^{-x}$ D. $-e^x + e^{-x}$
36. If equation of motion of a particle is $s = 4t^2 - 3t + 2$ then at $t = 1$ sec. the velocity $v =$ _____ unit/sec.
 A. -5 B. 7
 C. 5 D. 3
37. એક કણની ગતિનું સમીકરણ $s = 4t^2 - 3t + 2$ છે તો $t = 1$ સેકન્ડે કણનું વેગ $v =$ _____ એકમ/ સેકન્ડ થશે.
 A. -5 B. 7
 C. 5 D. 3
38. If $x = a(1 + \cos \theta)$, $y = a \sin \theta$ then $\frac{dy}{dx} =$ _____.
 A. $\cot \theta$ B. $\tan \theta$
 C. $-\cot \theta$ D. $-\tan \theta$
39. If $x = a(1 + \cos \theta)$, $y = a \sin \theta$ then $\frac{dy}{dx} =$ _____.
 A. $\cot \theta$ B. $\tan \theta$
 C. $-\cot \theta$ D. $-\tan \theta$
40. Derivative of $\tan^{-1} x$ with respect to $\cot^{-1} x =$ _____.

- A. 0 B. -1
C. 1 D. None of these
33. $\tan^{-1} x$ ને $\cot^{-1} x$ વિશે વિકલિત = _____.
- A. 0 B. -1
C. 1 D. કોઈપણ નહીં
34. $\frac{d}{dx}(x^x) =$ _____
- A. xx^{x-1} B. 1
C. $x^x(1 + \log x)$ D. $(x + \log x)$
35. $\frac{d}{dx}(x^x) =$ _____
- A. xx^{x-1} B. 1
C. $x^x(1 + \log x)$ D. $(x + \log x)$
- For the function $f(x)$, the function $f(x)$ is minimum at $x = a$ then necessary condition is _____.
36. A. $f''(a) = 0$ B. $f''(a) > 0$
C. $f''(a) < 0$ D. None of these
37. વિધેય $f(x)$, $x = a$ આગળ વિધેય $f(x)$ ન્યૂનતમ છે, માટે પર્યાપ્ત શરત _____ છે.
- A. $f''(a) = 0$ B. $f''(a) > 0$
C. $f''(a) < 0$ D. કોઈપણ નહીં
38. $\frac{d}{dx}(\log \sin \frac{\pi}{2}) =$ _____.
- A. 0 B. 1
C. -1 D. None of these
39. $\frac{d}{dx}(\log \sin \frac{\pi}{2}) =$ _____.
- A. 0 B. 1
C. -1 D. કોઈપણ નહીં
40. If $f(x) = \frac{\log x}{x}$ then $f'(1) =$ _____
- A. 0 B. 1
C. 2 D. -1
41. જો $f(x) = \frac{\log x}{x}$ તો $f'(1) =$ _____
- A. 0 B. 1
C. 2 D. -1
42. $\frac{d}{dx}(e^{-\log x}) =$ _____
- A. $\frac{1}{x}$ B. $-\frac{1}{x}$
C. $\frac{1}{x^2}$ D. $-\frac{1}{x^2}$
43. $\frac{d}{dx}(e^{-\log x}) =$ _____
- A. $\frac{1}{x}$ B. $-\frac{1}{x}$
C. $\frac{1}{x^2}$ D. $-\frac{1}{x^2}$
44. $\frac{d}{dx}\left(\frac{dy}{dx}\right) =$ _____
- A. $2 \frac{dy}{dx}$ B. $\frac{d^2 y}{dx^2}$
C. $\frac{d^2 x}{dy^2}$ D. None of these

39. $\frac{d}{dx}\left(\frac{dy}{dx}\right) = \underline{\hspace{2cm}}$
- A. $2\frac{dy}{dx}$ B. $\frac{d^2y}{dx^2}$
 C. $\frac{d^2x}{dy^2}$ D. કોઈપણ નહીં
40. If $y = f(u)$, $u = f(v)$, $v = f(x)$ then $\frac{dy}{dx} = \underline{\hspace{2cm}}$
- A. $\frac{dy}{du} \times \frac{du}{dv} \times \frac{dv}{dx}$ B. $\frac{dy}{du} + \frac{du}{dv} + \frac{dv}{dx}$
 C. $\frac{dy}{du} - \frac{du}{dv} - \frac{dv}{dx}$ D. None of these
41. If $y = f(u)$, $u = f(v)$, $v = f(x)$ then $\frac{dy}{dx} = \underline{\hspace{2cm}}$
- A. $\frac{dy}{du} \times \frac{du}{dv} \times \frac{dv}{dx}$ B. $\frac{dy}{du} + \frac{du}{dv} + \frac{dv}{dx}$
 C. $\frac{dy}{du} - \frac{du}{dv} - \frac{dv}{dx}$ D. કોઈપણ નહીં
42. If $\int f(x) dx = \sin x + c$ then $f(x) = \underline{\hspace{2cm}}$.
- A. $\cos x$ B. $\sin x$
 C. $-\cos x$ D. $-\sin x$
43. જો $\int f(x) dx = \sin x + c$ તો $f(x) = \underline{\hspace{2cm}}$.
- A. $\cos x$ B. $\sin x$
 C. $-\cos x$ D. $-\sin x$
44. $\int (u \cdot v) dx = \underline{\hspace{2cm}}$.
- A. $u \cdot \int v dx + v \cdot \int u dx$ B. $u \cdot \int v dx - \int \left(\frac{du}{dx} \int v dx\right) dx$
 C. $\int u dx \cdot \int v dx$ D. $u \cdot \int v dx - v \cdot \int u dx$
45. $\int (u \cdot v) dx = \underline{\hspace{2cm}}$.
- A. $u \cdot \int v dx + v \cdot \int u dx$ B. $u \cdot \int v dx - \int \left(\frac{du}{dx} \int v dx\right) dx$
 C. $\int u dx \cdot \int v dx$ D. $u \cdot \int v dx - v \cdot \int u dx$
46. $\int \log|x| dx = \underline{\hspace{2cm}} + c$
- A. $\frac{1}{x}$ B. e^x
 C. $x \log x - x$ D. None of these
47. $\int \log|x| dx = \underline{\hspace{2cm}} + c$
- A. $\frac{1}{x}$ B. e^x
 C. $x \log x - x$ D. કોઈપણ નહીં
48. $\int \frac{x}{x^2+25} dx = \underline{\hspace{2cm}} + c$
- A. $2 \log(x^2 + 25)$ B. $\frac{1}{2} \log(x^2 + 25)$
 C. $\frac{1}{5} \tan^{-1} \frac{x}{5}$ D. None of these
49. $\int \frac{x}{x^2+25} dx = \underline{\hspace{2cm}} + c$
- A. $2 \log(x^2 + 25)$ B. $\frac{1}{2} \log(x^2 + 25)$
 C. $\frac{1}{5} \tan^{-1} \frac{x}{5}$ D. કોઈપણ નહીં
50. $\int \frac{dx}{\sqrt{1-x^2}} = \underline{\hspace{2cm}} + c$
- A. $\sin^{-1} x$ B. $\cos^{-1} x$
 C. $\tan^{-1} x$ D. $\sec^{-1} x$

- $\int \frac{dx}{\sqrt{1-x^2}} = \text{_____} + c$
 44. A. $\sin^{-1} x$ B. $\cos^{-1} x$
 C. $\tan^{-1} x$ D. $\sec^{-1} x$
- $\int_{-\pi/2}^{\pi/2} \cos x dx = \text{_____}$
 46. A. 0 B. 1
 C. -1 D. 2
- $\int_{-\pi/2}^{\pi/2} \cos x dx = \text{_____}$
 45. A. 0 B. 1
 C. -1 D. 2
- $\int_0^{\sqrt{3}} \frac{dx}{1+x^2} = \text{_____}$
 47. A. $\frac{\pi}{3}$ B. $\frac{\pi}{6}$
 C. $\frac{\pi}{4}$ D. $\frac{\pi}{2}$
- $\int_0^{\sqrt{3}} \frac{dx}{1+x^2} = \text{_____}$
 48. A. $\frac{\pi}{3}$ B. $\frac{\pi}{6}$
 C. $\frac{\pi}{4}$ D. $\frac{\pi}{2}$
- $\int_0^{\pi/4} \sec^2 x dx = \text{_____}$
 49. A. 0 B. 1
 C. $\sqrt{3}$ D. $\frac{1}{\sqrt{3}}$
- $\int_0^{\pi/4} \sec^2 x dx = \text{_____}$
 50. A. 0 B. 1
 C. $\sqrt{3}$ D. $\frac{1}{\sqrt{3}}$
- $\int \frac{\cos(\log x)}{x} dx = \text{_____} + c$
 51. A. $\sin(\log x)$ B. $\sin e^x$
 C. $\cos e^x$ D. $-\sin(\log x)$
- $\int \frac{\cos(\log x)}{x} dx = \text{_____} + c$
 52. A. $\sin(\log x)$ B. $\sin e^x$
 C. $\cos e^x$ D. $-\sin(\log x)$
- $\int \frac{dx}{9+x^2} = \text{_____} + c$
 53. A. $\frac{1}{9} \tan^{-1} \frac{x}{9}$ B. $\frac{1}{3} \tan^{-1} \frac{x}{3}$
 C. $\frac{1}{9} \tan^{-1} 9x$ D. $\frac{1}{3} \tan^{-1} 3x$
- $\int \frac{dx}{9+x^2} = \text{_____} + c$
 54. A. $\frac{1}{9} \tan^{-1} \frac{x}{9}$ B. $\frac{1}{3} \tan^{-1} \frac{x}{3}$
 C. $\frac{1}{9} \tan^{-1} 9x$ D. $\frac{1}{3} \tan^{-1} 3x$

51. $\int e^x(\sin x + \cos x) dx = \underline{\hspace{2cm}} + c$
- A. $e^x \sin x$ B. $e^x \cos x$
 C. $-e^x \sin x$ D. $-e^x \cos x$
52. $\int \frac{dx}{x \log x} = \underline{\hspace{2cm}} + c$
- A. $\log|x|$ B. $-\log(\log x)$
 C. $\log(\log x)$ D. None of these
53. $\int \frac{dx}{1-x^2} = \underline{\hspace{2cm}} + c$
- A. $\frac{1}{2} \log \left| \frac{1-x}{1+x} \right|$ B. $\frac{1}{2} \log \left| \frac{1+x}{1-x} \right|$
 C. $\sin^{-1} x$ D. $\log \left| x + \sqrt{1-x^2} \right|$
54. If $I = \int_0^{\pi/2} \frac{\cos x}{\cos x + \sin x} dx$ then $I = \underline{\hspace{2cm}}$
- A. π B. $\pi/2$
 C. 0 D. $\pi/4$
55. $\int (\sec^{-1} x + \operatorname{cosec}^{-1} x) dx = \underline{\hspace{2cm}} + C$
- A. $\frac{\pi}{2} x$ B. 1
 C. x D. πx
56. $\int \frac{\cos x - \sin x}{\sin x + \cos x} dx = \underline{\hspace{2cm}} + c$
- A. $2(\sin x + \cos x)$ B. $\log|\sin x + \cos x|$
 C. $\log|\sin 2x|$ D. $\log|\cos x - \sin x|$
57. The order and degree of the differential equation $\left(\frac{d^2 y}{dx^2}\right)^3 + 3\left(\frac{dy}{dx}\right) - 5y = 0$ are respectively $\underline{\hspace{2cm}}$ and $\underline{\hspace{2cm}}$
- A. $2, 3$ B. $3, 2$
 C. $1, 2$ D. $2, 1$

૫૭. વિકલ સમીકરણ $\left(\frac{d^2y}{dx^2}\right)^3 + 3\left(\frac{dy}{dx}\right) - 5y = 0$ નું કક્ષા તથા પરિમાણ અનુક્રમે _____ અને _____ છે.
- A. 2,3 B. 3,2
C. 1,2 D. 2,1

58. the differential equation $\frac{dy}{dx} + y \tan x = \cos x$ is a _____ differential equation
- A. Variable separable B. homogenous
C. linear D. second order

૫૮. વિકલ સમીકરણ $\frac{dy}{dx} + y \tan x = \cos x$ _____ વિકલ સમીકરણ છે.
- A. વિયોજનીય ચલોવાળા B. સપરિમાણ
C. સુરેખ D. દ્વિતીય કક્ષાની

59. The integrating factor of $\frac{dy}{dx} + \frac{2y}{x} = e^x$, is _____
- A. $\frac{2}{x^2}$ B. $\frac{2}{x}$
C. $\frac{x^2}{x^2}$ D. $\frac{2}{2x}$

૫૯. વિકલ સમીકરણ $\frac{dy}{dx} + \frac{2y}{x} = e^x$ નો સંકલ્પકારક અવયવ _____ છે.
- A. $\frac{2}{x^2}$ B. $\frac{2}{x}$
C. $\frac{x^2}{x^2}$ D. $\frac{2}{2x}$

60. The degree of homogenous function $f(x, y) = \frac{x^3 - y^3}{x + y}$ is _____
- A. 1 B. 2
C. 3 D. Undefined

૬૦. સપરિમાણ વિધેય $f(x, y) = \frac{x^3 - y^3}{x + y}$ નું પરિમાણ is _____ છે.
- A. 1 B. 2
C. 3 D. અવ્યાખ્યાયિત

61. Integrating factor of equation $\frac{dy}{dx} = y \tan x + e^x$ is _____
- A. $\tan x$ B. $\sin x$
C. $\cos x$ D. e^x

૬૧. સમીકરણ $\frac{dy}{dx} = y \tan x + e^x$ નો સંકલ્પકારક અવયવ _____ છે.
- A. $\tan x$ B. $\sin x$
C. $\cos x$ D. e^x

62. Solution of differential equation $x dy + y dx = 0$ is given by
- A. $\frac{x}{y} = c$ B. $\frac{y}{x} = c$
C. $xy = c$ D. none of these

૬૨. વિકલ સમીકરણ $x dy + y dx = 0$ નો ઉકેલ _____ છે.
- A. $\frac{x}{y} = c$ B. $\frac{y}{x} = c$
C. $xy = c$ D. કોઈપણ નહીં

63. solution of differential equation $\frac{dy}{dx} + Py = Q$ is _____
- A. $Y(I.F.) = \int Q(I.F.)dx + C$ B. $Y(I.F.) = - \int Q(I.F.)dx + C$
C. $Y(P.Q) = \int (I.F.)dx + C$ D. none of these

૬૩. વિકલ સમીકરણ $\frac{dy}{dx} + Py = Q$ નો ઉકેલ _____ છે.
- A. $Y(I.F.) = \int Q(I.F.)dx + C$ B. $Y(I.F.) = - \int Q(I.F.)dx + C$
C. $Y(P.Q) = \int (I.F.)dx + C$ D. કોઈપણ નહીં

differential equation of $y = ae^{2x} + be^{-2x}$ is _____

64. A. $\frac{d^2y}{dx^2} + 4y = 0$ B. $\frac{d^2y}{dx^2} - 4y = 0$
C. $-\frac{d^2y}{dx^2} + y = 0$ D. None of these

વિધેય $y = ae^{2x} + be^{-2x}$ નો વિકલ સમીકરણ _____ છે.

૬૪. A. $\frac{d^2y}{dx^2} + 4y = 0$ B. $\frac{d^2y}{dx^2} - 4y = 0$
C. $-\frac{d^2y}{dx^2} + y = 0$ D. કોઈપણ નહીં

differential equation of all straight lines $y = mx + c$ is _____

65. A. $\frac{dy}{dx} = 0$ B. $m \frac{d^2y}{dx^2} = 0$
C. $c \frac{dy}{dx} = 0$ D. $\frac{d^2y}{dx^2} = 0$

રેખા સંહિતા $y = mx + c$ નું વિકલ સમીકરણ _____ છે.

૬૫. A. $\frac{dy}{dx} = 0$ B. $m \frac{d^2y}{dx^2} = 0$
C. $c \frac{dy}{dx} = 0$ D. $\frac{d^2y}{dx^2} = 0$

for the differential equation $\frac{dy}{dx} + Py = Q$ the I.F. = _____

66. A. $e^{-\int P dx}$ B. $e^{\int Q dx}$
C. $e^{\int P dx}$ D. $e^{-\int Q dx}$

વિકલ સમીકરણ $\frac{dy}{dx} + Py = Q$ નો સંકલ્પકારક અવયવ = _____ છે.

૬૬. A. $e^{-\int P dx}$ B. $e^{\int Q dx}$
C. $e^{\int P dx}$ D. $e^{-\int Q dx}$

solution of differential equation $\frac{d^2y}{dx^2} + y = 0$ is _____

67. A. $y = \sin x + \cos x$ B. $y = \sin x$
C. $y = \cos x$ D. None of these

વિકલ સમીકરણ $\frac{d^2y}{dx^2} + y = 0$ નો ઉકેલ _____ છે.

૬૭. A. $y = \sin x + \cos x$ B. $y = \sin x$
C. $y = \cos x$ D. કોઈપણ નહીં

differential equation of circle $x^2 + y^2 = r^2$ (r is constant) is _____ .

68. A. $x + y \frac{dy}{dx} = 0$ B. $x - y \frac{dy}{dx} = 0$
C. $-x - y \frac{dy}{dx} = 0$ D. $-x + y \frac{dy}{dx} = 0$

વર્તુળ $x^2 + y^2 = r^2$ (r અચળ) નું વિકલ સમીકરણ _____ છે.

૬૮. A. $x + y \frac{dy}{dx} = 0$ B. $x - y \frac{dy}{dx} = 0$
C. $-x - y \frac{dy}{dx} = 0$ D. $-x + y \frac{dy}{dx} = 0$

degree of differential equation $\left(\frac{d^2y}{dx^2}\right)^2 + \left(\frac{dy}{dx}\right)^3 = 0$ is _____

69. A. 0 B. 3
C. 2 D. 1

વિકલ સમીકરણ $\left(\frac{d^2y}{dx^2}\right)^2 + \left(\frac{dy}{dx}\right)^3 = 0$ નું પરિમાણ _____ છે.

૬૯. A. 0 B. 3
C. 2 D. 1

70. Order of differetiatial equation $\frac{d^3y}{dx^3} + x\frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = 0$ is _____.
- A. 0 B. 3
C. 2 D. 1
90. વિકલ સમીકરણ $\frac{d^3y}{dx^3} + x\frac{d^2y}{dx^2} + x\frac{dy}{dx} + y = 0$ ની કક્ષા _____ છે.
- A. 0 B. 3
C. 2 D. 1
