

Gujarat Technological University

Diploma Engineering C to D Bridge Course Examination

Subject Code: C320002

Date: 30/12/2015

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 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

Real part of the complex no $3+2i$ is _____

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

If $Z=4+3i$ then $|Z| = \underline{\hspace{2cm}}$

2. A. 4 B. 1
C. 3 D. 5

If $Z=2+i$ then conjugate complex no $\bar{Z} =$

3. A. $2-i$ B. $2+i$
 C. $1+2i$ D. $1-2i$

Argument θ of complex no $1+i$ is

4. A. π B. 1
 C. $\frac{\pi}{4}$ D. 0

If $Z_1=2+3i$ and $Z_2=1+i$ then $Z_1+Z_2=$

5. A. $3+4i$ B. $2+4i$
 C. $4+3i$ D. $1+2i$

If $a + ib = \frac{1}{1+2i}$ then a=_____

In complex no $i =$

7. A. $\sqrt{1}$ B. $(1,0)$
C. $\sqrt{-1}$ D. None of these

$$(\cos \theta + i \sin \theta)^n \equiv$$

8. A. $\cos^n\theta + i \sin^n\theta$ B. $n\cos\theta + in \sin\theta$
 C. $\cos^n\theta + i \sin^n\theta$ D. $\cos^n\theta - i \sin^n\theta$

C. $\cosh \theta + i \sinh \theta$
 If $x^2 + 1 = 0$ then $x =$

9. If $x^2 + 1 = 0$ then $x = \underline{\hspace{2cm}}$

A. i B. -i
C. 1 D. -1

$$\sqrt{4}$$

10. $\sqrt{-4} =$ _____
A. 2 B. A and C both
C. -2 D. -2i

If $f(x) = x^2 + 1$, then $f(2) =$

- If $f(x) = x + 1$ then $f(2) = \underline{\hspace{2cm}}$

12. If $f(x) = \frac{1}{x+1}$ then $f(x) + f\left(\frac{1}{x}\right) = \underline{\hspace{2cm}}$
 A. 0 B. $\frac{x}{2}$
 C. 1 D. 2
- If $f(x) = \log x$ then $f(xy) = \underline{\hspace{2cm}}$
13. A. $f(x)+f(y)$ B. $f(x)-f(y)$
 C. $f(x)f(y)$ D. $f(x+y)$
- If $f(x) = \sin x$ then $f\left(\frac{\pi}{2}\right) = \underline{\hspace{2cm}}$
14. A. 0 B. 0.5
 C. -1 D. 1
- $\lim_{x \rightarrow 1} \frac{x}{x+1} = \underline{\hspace{2cm}}$
15. A. 2 B. $\frac{1}{2}$
 C. 0 D. 1
- $\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a} = \underline{\hspace{2cm}}$
16. A. 0 B. nx^{n-1}
 C. na^{n-1} D. None of these
- $\lim_{\theta \rightarrow 0} \frac{\sin 2\theta}{\theta} = \underline{\hspace{2cm}}$
17. A. 1/2 B. 1
 C. 0 D. 2
- $\lim_{x \rightarrow 0} \frac{2^x - 1}{x} = \underline{\hspace{2cm}}$
18. A. $\log_e 2$ B. e^2
 C. $\log_e x$ D. 0
- $\lim_{n \rightarrow \infty} \frac{n}{n+1} = \underline{\hspace{2cm}}$
19. A. 1/2 B. 2
 C. 1 D. 0
- $\lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n = \underline{\hspace{2cm}}$
20. A. 0 B. 1
 C. e^x D. e
- $\lim_{x \rightarrow 1} \frac{x-1}{x^2 - 3x + 2} = \underline{\hspace{2cm}}$
21. A. -1 B. 1
 C. 2 D. 0
- $\lim_{x \rightarrow 0} \frac{2^x - 3^x}{x} = \underline{\hspace{2cm}}$
22. A. $\log(6)$ B. $\log(2/3)$
 C. log2 D. log3
- $\frac{d}{dx} (\sin x) = \underline{\hspace{2cm}}$
23. A. -cosx B. cosx
 C. sinx D. $\sec^2 x$
- $\frac{d}{dx} (2^x) = \underline{\hspace{2cm}}$
24. A. log2 B. 2^x
 C. $2^x \log 2$ D. $2^x + \log 2$

$$\frac{d}{dx}(x^2 - \log x) = \underline{\hspace{2cm}}$$

25. A. $2x - \frac{1}{x}$ B. $2x + \frac{1}{x}$
C. $2x - 1$ D. 2

$$\frac{d}{dx}(e^x + 2 \tan x) = \underline{\hspace{2cm}}$$

26. A. $e^x + \sec^2 x$ B. $2 \sec^2 x$
C. $e^x + 2 \sec x \tan x$ D. $e^x + 2 \sec^2 x$

$$\frac{d}{dx}(x \log x) = \underline{\hspace{2cm}}$$

27. A. $x + \log x$ B. $1/x$
C. $x - \log x$ D. $1 + \log x$

$$\frac{d}{dx}(\sin^2 x) = \underline{\hspace{2cm}}$$

28. A. $\sin x \cos x$ B. $2 \sin x$
C. $\sin 2x$ D. $\cos^2 x$

$$\frac{d}{dx}(e^{2x+5}) = \underline{\hspace{2cm}}$$

29. A. e^{2x+5} B. $2e^{2x+5}$
C. e^{2x} D. $2xe^{2x+5}$

$$\frac{d^2}{dx^2}(\cos x) = \underline{\hspace{2cm}}$$

30. A. $-\sin x$ B. $\sin x$
C. $-\cos x$ D. $\cos x$

$$\text{If } y = \sin t \text{ and } x = 1 + \cos t \text{ then } \frac{dy}{dx} = \underline{\hspace{2cm}}$$

31. A. $-\cot x$ B. $\cot x$
C. $\tan x$ D. $-\tan x$

$$\frac{d}{dx}(\log(\sin x)) = \underline{\hspace{2cm}}$$

32. A. $\cot x$ B. $\tan x$
C. $-\tan x$ D. $-\cot x$

$$\frac{d}{dx}\left(\frac{x}{x+1}\right) = \underline{\hspace{2cm}}$$

33. A. $\frac{-1}{(x+1)^2}$ B. $\frac{1}{(x+1)}$
C. $\frac{1}{(x+1)^2}$ D. $\frac{x}{(x+1)^2}$

$$\frac{d}{dx}(x^2 e^x) = \underline{\hspace{2cm}}$$

34. A. $2x + e^x$ B. $(x^2 + 2x)e^x$
C. $2xe^x$ D. None of these

$$\text{If } y = 2at \text{ and } x = at^2 \text{ then } \frac{dy}{dx} = \underline{\hspace{2cm}}$$

35. A. t B. $2t$
C. $2a$ D. $\frac{1}{t}$

$$\text{If } s = t^2 + 2t + 1 \text{ then at } t = 1 \text{ sec velocity } v = \underline{\hspace{2cm}}$$

36. A. 2 m/s B. 4 m/s
C. 1 m/s D. 3 m/s

37. If $f'(a) = 0$ and $f''(a) > 0$ then f is _____ at "a"

- A. maximum
C. minimum

- B. Increasing
D. Decreasing

If function $f(x)$ if maximum or minimum at $x=a$ then $f'(a) = \underline{\hspace{2cm}}$

38. A. 0
C. 1
B. a
D. 2

$$\frac{d}{dx}(\log 3) = \underline{\hspace{2cm}}$$

39. A. 1/3
C. 0
B. log3
D. 3

If $y=f(u)$ and $u=g(x)$ then $\frac{dy}{dx} = \underline{\hspace{2cm}}$

40. A. $\frac{dy}{du} + \frac{du}{dx}$
C. $\frac{dy}{dx} \frac{du}{dx}$
B. $\frac{dy}{du} - \frac{du}{dx}$
D. $\frac{dy}{du} \frac{du}{dx}$

$$\int \frac{1}{x} dx = \underline{\hspace{2cm}}$$

41. A. $-1/x^2 + c$
C. $-x + c$
B. $\log x + c$
D. 1

$$\int 3x^2 + e^x dx = \underline{\hspace{2cm}}$$

42. A. $3x^3 + e^x + c$
C. $3(x^3 + e^x) + c$
B. $6x + e^x + c$
D. $x^3 + e^x + c$

$$\int \frac{2x}{x^2 + 1} dx = \underline{\hspace{2cm}}$$

43. A. $\log(x^2 + 1) + c$
C. $2x \tan^{-1} x + c$
B. $-(x^2 + 1)^{-2} + c$
D. $\tan^{-1} x + c$

$$\int \sin(ax + b) dx = \underline{\hspace{2cm}}$$

44. A. $-\frac{\sin(ax + b)}{a} + c$
C. $-\frac{\cos(ax + b)}{a} + c$
B. $-a \cos(ax + b) + c$
D. $\frac{\cos(ax + b)}{a} + c$

$$\int e^{x^2} 2x dx = \underline{\hspace{2cm}}$$

45. A. $e^{x^2} + c$
C. $e^x + c$
B. $e^{2x} + c$
D. None of these

$$\int \sin^2 x \cos x dx = \underline{\hspace{2cm}}$$

46. A. $2\sin x \cos^2 x - \sin^3 x + c$
C. $\frac{\sin x}{3} + c$
B. $2\sin x - \sin^2 x + c$
D. $\frac{\sin^3 x}{3} + c$

$$\int_1^2 2x dx = \underline{\hspace{2cm}}$$

47. A. 4
C. 5
B. 3
D. 2

$$\int_0^{\pi/2} \cos x dx = \underline{\hspace{2cm}}$$

48. A. 1
C. 0
B. -1
D. 2

$$\int_{-\pi/2}^{\pi/2} \sin x dx = \underline{\hspace{2cm}}$$

49. A. 1
B. -1

C. 0 D. -2

Area of region bounded by $y=f(x)$, $x=a$, $x=b$ and X-axis is obtained by _____

50. A. $\int_a^b dx$ B. $\int_a^b ydx$
C. $2ab$ D. None of these

51. A. $x(\log x - 1) + c$ B. $1/x + c$
C. $x \log x - 1 + c$ D. None of these
 $\int \cot x dx = _____$

52. A. $\log|\sec x| + c$ B. $\log|\cos x| + c$
C. $-\operatorname{cosec}^2 x + c$ D. $\log|\sin x| + c$

$$\int_0^{\pi/2} \frac{\cos x}{\cos x + \sin x} dx = _____$$

53. A. $\frac{1}{4}$ B. $\frac{\pi}{4}$
C. $\frac{\pi}{2}$ D. 0

Area of region bounded by $y=1$, $x=0$, $x=2$ and X-axis is _____

54. A. 1 unit B. 2 unit
C. 3 unit D. None of these

Volume of solid generated by revolving region bounded by $y=f(x)$, $x=a$ and $x=b$ around X-axis is _____

55. A. $\int_a^b y^2 dx$ B. $\int_a^b x^2 dy$
C. $\pi \int_a^b y^2 dx$ D. $\pi \int_a^b x^2 dy$

Volume of solid generated by revolving region bounded by $y^2=x$, $x=1$ and $x=2$ around X-axis is _____

56. A. $\frac{3\pi}{2}$ unit B. $\frac{\pi}{2}$ unit
C. π unit D. None of these

57. Order of differential equation $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} - y = 0$ is _____.
A. 1 B. 0
C. 3 D. 2

58. Degree of differential equation $\left(\frac{d^2y}{dx^2}\right)^2 - \left(\frac{dy}{dx}\right)^3 + y = 0$ is _____.
A. 4 B. 3
C. 2 D. 1

Differential equation of $y=a \cos(x+c)$ is _____

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

Differential equation of $y=ax^2$ is _____

- A. $x \frac{dy}{dx} + 2y = 0$ B. $\frac{dy}{dx} - 2y = 0$
C. $x \frac{dy}{dx} - 2y = 0$ D. None of these

General solution of differential equation of order two contains _____ arbitrary constants

61. A. 0 B. Infinite
C. 1 D. 2

Which of the following is standard form of linear differential equation?

62. A. $\frac{dy}{dx} + Py = Q$ B. $\frac{d^2y}{dx^2} + Py = Q$
C. $\frac{dy}{dx} + Px = Q$ D. None of these

Solution of differential equation $x dx - y dy = 0$ is _____

63. A. $x^2 + y^2 = c$ B. $x^2 y^2 = c$
C. $x^2 - y^2 = c$ D. None of these

Solution of differential equation $y dx + x dy = 0$ is _____

64. A. $x + y = c$ B. $xy = c$
C. $x^2 + y^2 = c$ D. None of these

What is the order of differential equation whose solution is $y = a \sin x + b \cos x$?

65. A. 3 B. 1
C. 2 D. 4

Which of the following is not the differential equation?

66. A. $xy dy + xy dx = 1$ B. $y = \sec x$
C. $\frac{dy}{dx} + y = 0$ D. $\frac{d^2y}{dx^2} + \frac{dy}{dx} = 0$

67. Degree of the differential equation $\tan\left(\frac{dy}{dx}\right) + y = 0$ is _____

- A. 1 B. 3
C. 2 D. Not defined

68. For differential equation $\frac{dy}{dx} + 7y = e^x$, I.F. = _____

- A. e^{7x} B. $7e^x$
C. e^x D. $7x$

69. For differential equation $\frac{dy}{dx} + \cot xy = \sin x$, I.F. = _____

- A. $-\sin x$ B. $e^{\sin x}$
C. $\sin x$ D. $\cos x$

Order of the homogeneous function $f(x,y) = x^2 + xy$ is _____

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

ગુજરાતી

નં. પુષ્ટ તેમજ વિકલ્પ

સંકર સંખ્યા $3+2i$ નો વાસ્તવિક ભાગ _____ છે.

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

$$\text{જો } Z=4+3i \text{ તો } |Z| = \underline{\hspace{2cm}}$$

2. A. 4 B. 1
C. 3 D. 5

જો $Z=2+i$ તો અનુભવ્ય સંકર સંખ્યા $\bar{Z} =$

3. A. $2-i$ B. $2+i$
C. $1+2i$ D. $1-2i$

સંકર સંખ્યા $1+i$ નો કોણાંક θ

4. A. π B. 1
 C. $\pi/4$ D. 0

$$\text{જો } Z_1 = 2+3i \text{ અને } Z_2 = 1+i \text{ તો } Z_1 + Z_2 =$$

5. A. $3+4i$ B. $2+4i$
C. $4+3i$ D. $1+2i$

$$\text{જો } a + ib = \frac{1}{1+2i} \text{ તો } a = \underline{\hspace{2cm}}$$

6. A. 5 B. $\sqrt{5}$
C. 1 D. $\frac{1}{5}$

સંકર સંખ્યા માં $i =$ _____

7. A. $\sqrt{1}$ B. (1,0)
 C. $\sqrt{-1}$ D. એક પણ જન્મી

$$(\cos \theta + i \sin \theta)^n =$$

8. A. $\cos^n\theta + i \sin^n\theta$ B. $n\cos\theta + in \sin\theta$
 C. $\cos n\theta + i \sin n\theta$ D. $\cos n\theta - i \sin n\theta$

$$\text{જો } x^2 + 1 = 0 \text{ તો } x =$$

9. A. I B. -i
C. 1 D. -1

$$\sqrt{-4} =$$

10. A. ડેટાબેઝ
B. એક ડેટાબેઝ
C. ડેટાબેઝ
D. ડેટાબેઝ

$$\textcircled{2} \quad f(x) = x^2 + 1 \quad \textcircled{3} \quad f(2) =$$

$$\text{If } f(x) = \frac{1}{x+1} \text{, then } f(x) + f\left(\frac{1}{x}\right) = \underline{\hspace{2cm}}$$

12. $\frac{x+1}{(x)}$

$$\text{f}(x) = \log x \quad \text{f}(xy) =$$

13. A. $f(x) + f(y)$ B. $f(x) - f(y)$
 C. $f(x)f(y)$ D. $f(x+y)$

14. If $f(x) = \sin x$ then $f\left(\frac{\pi}{2}\right) =$ _____

- A. 0
C. -1

- B. 0.5
D. 1

$$\lim_{x \rightarrow 1} \frac{x}{x+1} = \underline{\hspace{2cm}}$$

15. A. 2
B. $\frac{1}{2}$
C. 0
D. 1

$$\lim_{x \rightarrow a} \frac{x^n - a^n}{x - a} = \underline{\hspace{2cm}}$$

16. A. 0
B. nx^{n-1}
C. na^{n-1}
D. એક પણ નહીં

$$17. \lim_{\theta \rightarrow 0} \frac{\sin 2\theta}{\theta} = \underline{\hspace{2cm}}$$

- A. $\frac{1}{2}$
B. 1
C. 0
D. 2

$$18. \lim_{x \rightarrow 0} \frac{2^x - 1}{x} = \underline{\hspace{2cm}}$$

- A. $\log_e 2$
B. e^2
C. $\log_e x$
D. 0

$$19. \lim_{n \rightarrow \infty} \frac{n}{n+1} = \underline{\hspace{2cm}}$$

- A. $\frac{1}{2}$
B. 2
C. 1
D. 0

$$20. \lim_{n \rightarrow \infty} \left(1 + \frac{1}{n}\right)^n = \underline{\hspace{2cm}}$$

- A. 0
B. 1
C. e^x
D. e

$$21. \lim_{x \rightarrow 1} \frac{x-1}{x^2 - 3x + 2} = \underline{\hspace{2cm}}$$

- A. -1
B. 1
C. 2
D. 0

$$22. \lim_{x \rightarrow 0} \frac{2^x - 3^x}{x} = \underline{\hspace{2cm}}$$

- A. $\log(6)$
B. $\log(2/3)$
C. log2
D. log3

$$23. \frac{d}{dx} (\sin x) = \underline{\hspace{2cm}}$$

- A. -cosx
B. cosx
C. Sinx
D. $\sec^2 x$

$$24. \frac{d}{dx} (2^x) = \underline{\hspace{2cm}}$$

- A. log2
B. 2^x
C. $2^x \log 2$
D. $2^x + \log 2$

$$\frac{d}{dx} (x^2 - \log x) = \underline{\hspace{2cm}}$$

25. A. $2x - \frac{1}{x}$
B. $2x + \frac{1}{x}$

- C. 2x-1
D. 2

$$26. \frac{d}{dx} (e^x + 2 \tan x) = \underline{\hspace{2cm}}$$

- A. $e^x + \sec^2 x$
B. $2 \sec^2 x$
C. $e^x + 2 \sec x \tan x$
D. $e^x + 2 \sec^2 x$

27. $\frac{d}{dx}(x \log x) = \underline{\hspace{2cm}}$

- A. $x + \log x$
B. $1/x$
C. $x - \log x$
D. $1 + \log x$

28. $\frac{d}{dx}(\sin^2 x) = \underline{\hspace{2cm}}$

- A. $\sin x \cos x$
B. $2 \sin x$
C. $\sin 2x$
D. $\cos^2 x$

29. $\frac{d}{dx}(e^{2x+5}) = \underline{\hspace{2cm}}$

- A. e^{2x+5}
B. $2e^{2x+5}$
C. e^{2x}
D. $2xe^{2x+5}$

30. $\frac{d^2}{dx^2}(\cos x) = \underline{\hspace{2cm}}$

- A. $-\sin x$
B. $\sin x$
C. $-\cos x$
D. $\cos x$

જો $y = \sin t$ અને $x = 1 + \cos t$ તો $\frac{dy}{dx} = \underline{\hspace{2cm}}$

31. $\frac{d}{dx}(\cot x) = \underline{\hspace{2cm}}$

- A. $-\cot x$
B. $\cot x$

C. $\tan x$

- D. $-\tan x$

32. $\frac{d}{dx}(\log(\sin x)) = \underline{\hspace{2cm}}$

- A. $\cot x$
B. $\tan x$

C. $-\tan x$

- D. $-\cot x$

$\frac{d}{dx}\left(\frac{x}{x+1}\right) = \underline{\hspace{2cm}}$

33. A. $\frac{-1}{(x+1)^2}$
B. $\frac{1}{(x+1)}$

C. $\frac{1}{(x+1)^2}$
D. $\frac{x}{(x+1)^2}$

$\frac{d}{dx}(x^2 e^x) = \underline{\hspace{2cm}}$

34. A. $2x + e^x$
B. $(x^2 + 2x)e^x$
C. $2xe^x$
D. એક પણ નહીં

જો $y = 2at$ અને $x = at^2$ તો $\frac{dy}{dx} = \underline{\hspace{2cm}}$

35. A. T
B. 2t
C. 2a
D. 1/t

જો $s = t^2 + 2t + 1$ તો $t = 1$ સેકન્ડે વેગાં $v = \underline{\hspace{2cm}}$

36. A. 2 m/s
B. 4 m/s
C. 1 m/s
D. 3 m/s

જો $f'(a) = 0$ અને $f''(a) > 0$ તો f એ “a” આગામી $\underline{\hspace{2cm}}$ છે.

37. A. મહત્તમ
B. ગઢે
C. નયનત્તમ
D. ઘટે

જો વિધય $f(x)$ એ $x=a$ આગામી મહત્તમ અથવા નયનત્તમ હોય તો $f'(a) = \underline{\hspace{2cm}}$

38. A. 0
B. a
C. 1
D. 2

39. $\frac{d}{dx}(\log 3) = \underline{\hspace{2cm}}$

- A. $\frac{1}{3}$
C. 0

- B. $\log 3$
D. 3

જો $y=f(u)$ અને $u=g(x)$ તથા $\frac{dy}{dx} = \frac{dy}{du} \cdot \frac{du}{dx}$ _____

40. A. $\frac{dy}{du} + \frac{du}{dx}$
C. $\frac{dy}{dx} \frac{du}{dx}$

- B. $\frac{dy}{du} - \frac{du}{dx}$
D. $\frac{dy}{du} \frac{du}{dx}$

41. $\int_x^1 dx = \text{_____}$

- A. $-1/x^2 + c$
C. $-x + c$

- B. $\log x + c$
D. 1

42. $\int 3x^2 + e^x dx = \text{_____}$

- A. $3x^3 + e^x + c$
C. $3(x^3 + e^x) + c$

- B. $6x + e^x + c$
D. $x^3 + e^x + c$

43. $\int \frac{2x}{x^2 + 1} dx = \text{_____}$

- A. $\log(x^2 + 1) + c$
C. $2x \tan^{-1} x + c$

- B. $-(x^2 + 1)^{-2} + c$
D. $\tan^{-1} x + c$

44. $\int \sin(ax + b) dx = \text{_____}$

- A. $-\frac{\sin(ax + b)}{a} + c$
C. $-\frac{\cos(ax + b)}{a} + c$

- B. $-a \cos(ax + b) + c$
D. $\frac{\cos(ax + b)}{a} + c$

45. $\int e^{x^2} 2x dx = \text{_____}$

- A. $e^{x^2} + c$
C. $e^x + c$

- B. $e^{2x} + c$
D. એક પણ નહીં

46. $\int \sin^2 x \cos x dx = \text{_____}$

- A. $2\sin x \cos^2 x - \sin^3 x + c$
C. $\frac{\sin x}{3} + c$

- B. $2\sin x - \sin^2 x + c$
D. $\frac{\sin^3 x}{3} + c$

47. $\int_1^2 2x dx = \text{_____}$

- A. 4
C. 5

- B. 3
D. 2

48. $\int_0^{\pi/2} \cos x dx = \text{_____}$

- A. 1
C. 0

- B. -1
D. 2

49. $\int_{-\pi/2}^{\pi/2} \sin x dx = \text{_____}$

- A. 1
C. 0

- B. -1
D. -2

$y=f(x)$, $x=a$, $x=b$ અને X-અક્ષ વડે ઘેરાવેલા પ્રદેશનું ક્ષેત્રફળ _____ ફુ.

50. A. $\int_a^b dx$
C. $2ab$

- B. $\int_a^b y dx$
D. એક પણ નહીં

51. $\int \log x dx = \text{_____}$

- A. $x(\log x - 1) + c$
 C. $x \log x - 1 + c$

- B. $1/x + c$
 D. એક પણ નહીં

52. $\int \cot x dx = \underline{\hspace{2cm}}$
 A. $\log|\sec x| + c$
 C. $-\operatorname{cosec}^2 x + c$
 B. $\log|\cos x| + c$
 D. $\log|\sin x| + c$

53. $\int_0^{\pi/2} \frac{\cos x}{\cos x + \sin x} dx = \underline{\hspace{2cm}}$
 A. $\frac{1}{4}$
 C. $\frac{\pi}{2}$
 B. $\frac{\pi}{4}$
 D. 0

$y=1$, $x=0$, $x=2$ અને X -અક્ષ વડે ઘરાયેલા પ્રદેશનું ક્ષેત્રફળ $\underline{\hspace{2cm}}$ છે.

54. A. 1 એકમ
 B. 2 એકમ
 C. 3 એકમ
 D. એક પણ નહીં

$y=f(x)$, $x=a$ અને $x=b$ વડે ઘરાયેલા પ્રદેશનું X -અક્ષ આસપાસ પરિભૂમણથી બનતા ધનનું ધનફળ $\underline{\hspace{2cm}}$ છે.

55. A. $\int_a^b y^2 dx$
 B. $\int_a^b x^2 dy$
 C. $\pi \int_a^b y^2 dx$
 D. $\pi \int_a^b x^2 dy$

$y^2=x$, $x=1$ અને $x=2$ વડે ઘરાયેલા પ્રદેશનું X -અક્ષ આસપાસ પરિભૂમણથી બનતા ધનનું ધનફળ $\underline{\hspace{2cm}}$ છે.

56. A. $\frac{3\pi}{2}$ એકમ
 B. $\frac{\pi}{2}$ એકમ
 C. π એકમ
 D. એક પણ નહીં

57. વિકલ સમીકરણ $\frac{d^2y}{dx^2} + 2\frac{dy}{dx} - y = 0$ ની કક્ષા $\underline{\hspace{2cm}}$ છે.
 A. 1
 B. 0
 C. 3
 D. 2

58. વિકલ સમીકરણ $\left(\frac{d^2y}{dx^2}\right)^2 - \left(\frac{dy}{dx}\right)^3 + y = 0$ નું પરિમાણ $\underline{\hspace{2cm}}$ છે.
 A. 4
 B. 3
 C. 2
 D. 1

$y=a \cos(x+c)$ નું વિકલ સમીકરણ $\underline{\hspace{2cm}}$ છે.

59. A. $\frac{d^2y}{dx^2} - y = 0$
 B. $\frac{d^2y}{dx^2} + y = 0$
 C. $\frac{d^2y}{dx^2} + a^2 y = 0$
 D. એક પણ નહીં

$y=ax^2$ નું વિકલ સમીકરણ $\underline{\hspace{2cm}}$ છે.

60. A. $x \frac{dy}{dx} + 2y = 0$
 B. $\frac{dy}{dx} - 2y = 0$
 C. $x \frac{dy}{dx} - 2y = 0$
 D. એક પણ નહીં

61. બે કક્ષા વાળા વિકલ સમીકરણ ના વ્યાપક ઉકેલ મા $\underline{\hspace{2cm}}$ સ્વૈર અચળાંક હોય છે.
 A. 0
 B. અસંખ્ય

C. 1

D. 2

નીચે પૈકી સુરેખ વિકલ સમીકરણ નું પ્રમાણિત સ્વરૂપ ક્યું છે?

62. A. $\frac{dy}{dx} + Py = Q$ B. $\frac{d^2y}{dx^2} + Py = Q$
 C. $\frac{dy}{dx} + Px = Q$ D. એક પણ નહીં

વિકલ સમીકરણ $x dx - y dy = 0$ નો ઉકેલ _____ છે.

63. A. $x^2 + y^2 = c$ B. $x^2 y^2 = c$
 C. $x^2 - y^2 = c$ D. એક પણ નહીં

વિકલ સમીકરણ $y dx + x dy = 0$ નો ઉકેલ _____ છે.

64. A. $x + y = c$ B. $xy = c$
 C. $x^2 + y^2 = c$ D. એક પણ નહીં

 $y = a \sin x + b \cos x$ જેનો ઉકેલ હોય તે વિકલ સમીકરણ ની કક્ષા કેટલી હોય?

65. A. 3 B. 1
 C. 2 D. 4

નીચે પૈકી ક્યું વિકલ સમીકરણ નથી?

66. A. $xy dy + xy dx = 1$ B. $y = \sec x$
 C. $\frac{dy}{dx} + y = 0$ D. $\frac{d^2y}{dx^2} + \frac{dy}{dx} = 0$

સમીકરણ $\tan\left(\frac{dy}{dx}\right) + y = 0$ ની કક્ષા _____ છે

67. A. 1 B. 3
 C. 2 D. અવ્યાપ્તાવીત

વિકલ સમીકરણ $\frac{dy}{dx} + 7y = e^x$, માટે I.F.=_____

68. A. e^{7x} B. $7e^x$
 C. e^x D. $7x$

વિકલ સમીકરણ $\frac{dy}{dx} + \cot xy = \sin x$, માટે I.F.=_____

69. A. $-\sin x$ B. $e^{\sin x}$
 C. $\sin x$ D. $\cos x$

સમપરિમાણ વિધેય $f(x,y) = x^2 + xy$ ની કક્ષા _____ છે.

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