

GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma Engineering – SEMESTER – 2(CtoD) New – EXAMINATION – Winter-2024

Subject Code: C4320002

Date: 06-01-2025

Subject Name: Engineering Mathematics

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 simple calculators and non-programmable scientific calculators are permitted.
5. English version is authentic.
6. Use only OMR to answer this question paper.

No. Question Text and Option. પૂર્ણ અને વિકલ્પો.

1. If $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, then $\text{Adj}(A) = \dots\dots\dots$

A. $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$

B. $\begin{bmatrix} d & b \\ c & a \end{bmatrix}$

C. $\begin{bmatrix} a & -b \\ -c & d \end{bmatrix}$

D. $\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$

૧. જો $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$, તો $\text{Adj}(A) = \dots\dots\dots$

A. $\begin{bmatrix} a & b \\ c & d \end{bmatrix}$

B. $\begin{bmatrix} d & b \\ c & a \end{bmatrix}$

C. $\begin{bmatrix} a & -b \\ -c & d \end{bmatrix}$

D. $\begin{bmatrix} d & -b \\ -c & a \end{bmatrix}$

2. If A is a matrix of order 3×4 and B is a matrix of order 3×4 , then the order of the matrix $A - B$ is

A. 3×4

B. 4×3

C. 3×3

D. 4×4

૨. જો A એ 3×4 કક્ષાનો અને B એ પણ 3×4 કક્ષાનો શ્રેણિક હોય, તો શ્રેણિક $A - B$ ની કક્ષા થાય.

A. 3×4

B. 4×3

C. 3×3

D. 4×4

3. If A is non-singular matrix, then

A. $|A| = 0$

B. $|A| \neq 0$

C. $A = 0$

D. $A \neq 0$

૩. જો A એ સામાન્ય શ્રેણિક હોય, તો

A. $|A| = 0$

B. $|A| \neq 0$

C. $A = 0$

D. $A \neq 0$

4. Let $A = \begin{bmatrix} 1 & -1 & 2 \\ 5 & 7 & 3 \\ -2 & -5 & 4 \end{bmatrix}$. What is the Minor of 5?

A. -43

B. -17

C. 14

D. 43

૪. ધારો કે $A = \begin{bmatrix} 1 & -1 & 2 \\ 5 & 7 & 3 \\ -2 & -5 & 4 \end{bmatrix}$ છે. 5 નો ઉપનિશ્ચાયક શું છે?

A. -43

B. -17

C. 14

D. 43

5. Let $P = \begin{bmatrix} 10 & -11 & 2 \\ 5 & 10 & 3 \\ -2 & -15 & 40 \end{bmatrix}$. Then $P^T = \dots\dots\dots$
- A. $\begin{bmatrix} 10 & 5 & -2 \\ -11 & 10 & -15 \\ 2 & 3 & 40 \end{bmatrix}$ B. $\begin{bmatrix} 10 & -11 & 2 \\ 5 & 10 & 3 \\ -2 & -15 & 40 \end{bmatrix}$
- C. $\begin{bmatrix} -10 & -5 & 2 \\ 11 & -10 & 15 \\ -2 & -3 & -40 \end{bmatrix}$ D. $\begin{bmatrix} 10 & -5 & 2 \\ -11 & 10 & -15 \\ 2 & 3 & 40 \end{bmatrix}$
૫. ધારો કે $P = \begin{bmatrix} 10 & -11 & 2 \\ 5 & 10 & 3 \\ -2 & -15 & 40 \end{bmatrix}$ છે. તો $P^T = \dots\dots\dots$
- A. $\begin{bmatrix} 10 & 5 & -2 \\ -11 & 10 & -15 \\ 2 & 3 & 40 \end{bmatrix}$ B. $\begin{bmatrix} 10 & -11 & 2 \\ 5 & 10 & 3 \\ -2 & -15 & 40 \end{bmatrix}$
- C. $\begin{bmatrix} -10 & -5 & 2 \\ 11 & -10 & 15 \\ -2 & -3 & -40 \end{bmatrix}$ D. $\begin{bmatrix} 10 & -5 & 2 \\ -11 & 10 & -15 \\ 2 & 3 & 40 \end{bmatrix}$
6. Let $R = \begin{bmatrix} 2022 & 2022 \\ 2023 & 2023 \end{bmatrix}$. Then $\det(R) = \dots\dots\dots$
- A. 2022 B. 2023
- C. 0 D. 1
૬. ધારો કે $R = \begin{bmatrix} 2021 & 2021 \\ 2022 & 2022 \end{bmatrix}$ છે. તો $\det(R) = \dots\dots\dots$
- A. 2022 B. 2023
- C. 0 D. 1
7. Let $M = \begin{bmatrix} 1 & -1 \\ 2 & -2 \end{bmatrix}$. Then $\text{Adj}(M) = \dots\dots\dots$
- A. $\begin{bmatrix} -2 & -1 \\ 2 & 1 \end{bmatrix}$ B. $\begin{bmatrix} -2 & 1 \\ -2 & 1 \end{bmatrix}$
- C. $\begin{bmatrix} -2 & 1 \\ 2 & 1 \end{bmatrix}$ D. $\begin{bmatrix} -2 & -1 \\ 2 & -1 \end{bmatrix}$
૭. ધારો કે $M = \begin{bmatrix} 1 & -1 \\ 2 & -2 \end{bmatrix}$ છે. તો $\text{Adj}(M) = \dots\dots\dots$
- A. $\begin{bmatrix} -2 & -1 \\ 2 & 1 \end{bmatrix}$ B. $\begin{bmatrix} -2 & 1 \\ -2 & 1 \end{bmatrix}$
- C. $\begin{bmatrix} -2 & 1 \\ 2 & 1 \end{bmatrix}$ D. $\begin{bmatrix} -2 & -1 \\ 2 & -1 \end{bmatrix}$
8. If A is any square matrix and B is inverse matrix of A, then AB is
- A. Zero matrix B. Identity matrix
- C. Upper triangular matrix D. Lower triangular matrix
૮. જો A કોઈ ચોરસ શ્રેણિક હોય અને B તેનો વ્યસ્ત શ્રેણિક હોય, તો AB થાય.
- A. શૂન્ય શ્રેણિક B. એકમ શ્રેણિક
- C. ઉર્ધ્વ ત્રિકોણાકાર શ્રેણિક D. અધઃ ત્રિકોણાકાર શ્રેણિક
9. If A is any matrix of order 3×3 and I is the identity matrix of order 3×3 , then $AI = \dots\dots\dots$
- A. I B. Zero matrix
- C. A D. None of these
૯. જો A કોઈ 3×3 કક્ષાનો શ્રેણિક હોય અને I એ 3×3 કક્ષાનો એકમ શ્રેણિક હોય, તો $AI = \dots\dots\dots$
- A. I B. શૂન્ય શ્રેણિક
- C. A D. આમાંથી એકપણ નહીં
10. What is the order of a matrix $\begin{bmatrix} 1 & 2 & 3 & 0 & 0 \end{bmatrix}$?
- A. 1×5 B. 5×1
- C. 1×3 D. 3×1
૧૦. શ્રેણિક $\begin{bmatrix} 1 & 2 & 3 & 0 & 0 \end{bmatrix}$ ની કક્ષા કેટલી છે?
- A. 1×5 B. 5×1
- C. 1×3 D. 3×1
11. If order of a matrix A is 3×5 and order of a matrix B is 5×4 , then order of a matrix AB is
- A. 5×5 B. 5×4
- C. 3×4 D. 4×3

૧૧. જો શ્રેણિક A ની કદા 3×5 અને શ્રેણિક B ની કદા 5×4 હોય, તો શ્રેણિક AB ની કદા થાય.

- A. 5×5
C. 3×4

- B. 5×4
D. 4×3

12. If $\begin{vmatrix} a & b \\ c & d \end{vmatrix} = 3$, then $\begin{vmatrix} 4a & 4b \\ 4c & 4d \end{vmatrix} = \dots\dots\dots$

- A. 48
C. 12

- B. 16
D. 3

૧૨. જો $\begin{vmatrix} a & b \\ c & d \end{vmatrix} = 3$, તો $\begin{vmatrix} 4a & 4b \\ 4c & 4d \end{vmatrix} = \dots\dots\dots$

- A. 48
C. 12

- B. 16
D. 3

13. If $\begin{vmatrix} 5x & 10 \\ 8 & 7 \end{vmatrix} = -10$, then x =

- A. 2
C. 1

- B. -2
D. 0

૧૩. જો $\begin{vmatrix} 5x & 10 \\ 8 & 7 \end{vmatrix} = -10$, તો x =

- A. 2
C. 1

- B. -2
D. 0

14. If $Y = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$, then $Y^2 = \dots\dots\dots$

- A. $\begin{bmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$

- B. $\begin{bmatrix} -2 & 0 & 0 \\ 0 & -2 & 0 \\ 0 & 0 & -2 \end{bmatrix}$

- C. $\begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix}$

- D. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

૧૪. જો $Y = \begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$, તો $Y^2 = \dots\dots\dots$

- A. $\begin{bmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$

- B. $\begin{bmatrix} -2 & 0 & 0 \\ 0 & -2 & 0 \\ 0 & 0 & -2 \end{bmatrix}$

- C. $\begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix}$

- D. $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$

15. If matrix form of the system of linear equations is $AX = B$, then $X = \dots\dots\dots$

- A. $(AB)^{-1}$
C. $A^{-1}B$

- B. AB^{-1}
D. $B^{-1}A$

૧૫. જો સુરેખ સમીકરણ સંહિતિ જું શ્રેણિક સ્વરૂપ $AX = B$ હોય તો, તો $X = \dots\dots\dots$

- A. $(AB)^{-1}$
C. $A^{-1}B$

- B. AB^{-1}
D. $B^{-1}A$

16. Matrix multiplication $\begin{bmatrix} 1 & -1 \end{bmatrix} \begin{bmatrix} 1 \\ -1 \end{bmatrix} = \dots\dots\dots$

- A. 2
C. 1

- B. -2
D. 0

૧૬. શ્રેણિક ગુણકાર $\begin{bmatrix} 1 & -1 \end{bmatrix} \begin{bmatrix} 1 \\ -1 \end{bmatrix} = \dots\dots\dots$

- A. 2
C. 1

- B. -2
D. 0

17. $\frac{d}{dx}(\sin 2x) = \dots\dots\dots$

- A. $2 \sin(2x)$

- B. $-2 \cos(2x)$

୧୭. C. $2 \cos(2x)$
 $\frac{d}{dx}(\sin 2x) = \dots$
 A. $2 \sin(2x)$
 B. $-2 \cos(2x)$
 C. $2 \cos(2x)$
 D. $2 \sin(2x)$
18. $\frac{d}{dx}(3x^2 + 5x - 11) = \dots$
 A. $6x + 5 - 11$
 B. $6x - 5$
 C. $6x + 5 + 11$
 D. $6x + 5$
୧୮. $\frac{d}{dx}(3x^2 + 5x - 11) = \dots$
 A. $6x + 5 - 11$
 B. $6x - 5$
 C. $6x + 5 + 11$
 D. $6x + 5$
19. $\frac{d}{dx}\left(\frac{1}{2x}\right) = \dots$
 A. $\frac{1}{2x^2}$
 B. $\frac{-1}{2x^2}$
 C. $\frac{1}{x^2}$
 D. $\frac{-1}{x^2}$
୧୯. $\frac{d}{dx}\left(\frac{1}{2x}\right) = \dots$
 A. $\frac{1}{2x^2}$
 B. $\frac{-1}{2x^2}$
 C. $\frac{1}{x^2}$
 D. $\frac{-1}{x^2}$
20. If $f(x) = 2^x$, then $f'(0) = \dots$
 A. $\log(2)$
 B. 0
 C. $2 \log(2)$
 D. $-2 \log(2)$
୨୦. ଯଦି $f(x) = 2^x$, ତେବେ $f'(0) = \dots$
 A. $\log(2)$
 B. 0
 C. $2 \log(2)$
 D. $-2 \log(2)$
21. If $y = \sin\left(\frac{\pi}{2023}\right)$, then $y' = \dots$
 A. 0
 B. 2
 C. 1
 D. -2
୨୧. ଯଦି $y = \sin\left(\frac{\pi}{2023}\right)$, ତେବେ $y' = \dots$
 A. 0
 B. 2
 C. 1
 D. -2
22. $\frac{d}{dt}(at^2) = \dots$, where a is constant.
 A. at
 B. a
 C. $2at$
 D. $2t$
୨୨. $\frac{d}{dt}(at^2) = \dots$, ଯେଉଁ a ଏକ ସ୍ଥିର ସଂଖ୍ୟା.
 A. at
 B. a
 C. $2at$
 D. $2t$
23. $\frac{d}{d\theta}(\theta^4) = \dots$
 A. 4θ
 B. θ^3
 C. $4\theta^3$
 D. 0
୨୩. $\frac{d}{d\theta}(\theta^4) = \dots$
 A. 4θ
 B. θ^3
 C. $4\theta^3$
 D. 0
24. If $y = e^x + 4$ then $y'' = \dots$
 A. 0
 B. $e^x + 4$
 C. e
 D. e^x

૨૪. જો $y = e^x + 4$ તો $y'' = \dots$
- A. 0 B. $e^x + 4$
C. e D. e^x
25. If the equation of motion of a particle is given by $s = t^2$ then its velocity $v = \dots$
- A. $v = 2t$ B. $v = t$
C. $v = -t$ D. $v = -2t$
૨૫. કોઈ એક કણની ગતિનું સમીકરણ $s = t^2$ વડે દર્શાવાયેલ છે તો તેનો વેગ $v = \dots$ થાય.
- A. $v = 2t$ B. $v = t$
C. $v = -t$ D. $v = -2t$
26. If $f'(a) = 0$ and $f''(a) > 0$ then the function $f(x)$ will have value at the point a .
- A. Maximum B. Minimum
C. Maximum and minimum D. Neither maximum nor minimum
૨૬. જો $f'(a) = 0$ અને $f''(a) > 0$ તો વિધેય $f(x)$ ને બિંદુ a આગળ કિમત હશે.
- A. મહત્તમ B. ન્યૂનતમ
C. મહત્તમ અને ન્યૂનતમ D. મહત્તમ કે ન્યૂનતમ કોઈપણ નહિ
27. $\frac{d}{dx}(\sec x) = \dots$
- A. $\sec x \cdot \tan x$ B. $\operatorname{Cosec} x \cdot \cot x$
C. $-\sec x \cdot \tan x$ D. $-\operatorname{Cosec} x \cdot \cot x$
૨૭. $\frac{d}{dx}(\sec x) = \dots$
- A. $\sec x \cdot \tan x$ B. $\operatorname{Cosec} x \cdot \cot x$
C. $-\sec x \cdot \tan x$ D. $-\operatorname{Cosec} x \cdot \cot x$
28. $\frac{d}{dx}(\log x) = \dots$
- A. $\frac{1}{x}$ B. x
C. $-\frac{1}{x}$ D. $-x$
૨૮. $\frac{d}{dx}(\log x) = \dots$
- A. $\frac{1}{x}$ B. x
C. $-\frac{1}{x}$ D. $-x$
29. $\frac{d}{dx}(\sin x + 10) = \dots$
- A. $\sin x + 10$ B. $\cos x + 10$
C. $\sin x$ D. $\cos x$
૨૯. $\frac{d}{dx}(\sin x + 10) = \dots$
- A. $\sin x + 10$ B. $\cos x + 10$
C. $\sin x$ D. $\cos x$
30. $\frac{d}{dx}(2\sqrt{x}) = \dots$
- A. $2\sqrt{x}$ B. $\sqrt{x}$
C. $\frac{1}{\sqrt{x}}$ D. $\frac{1}{2\sqrt{x}}$
૩૦. $\frac{d}{dx}(2\sqrt{x}) = \dots$
- A. $2\sqrt{x}$ B. $\sqrt{x}$
C. $\frac{1}{\sqrt{x}}$ D. $\frac{1}{2\sqrt{x}}$
31. If $f(x) = \cos x$ then $f'(\pi) = \dots$
- A. -1 B. 0
C. 1 D. π

31. જો $f(x) = \cos x$ તો $f'(\pi) = \dots\dots\dots$
 A. -1 B. 0
 C. 1 D. π
32. In the symbol of differentiation, $y'' = \dots\dots\dots$
 A. $\frac{d^2 y}{d^2 x}$ B. $\frac{dy^2}{dx^2}$
 C. $\frac{d^2 y}{dx^2}$ D. $\frac{dy^2}{d^2 x}$
32. વિકલનના સંજ્ઞા મુજબ $y'' = \dots\dots\dots$
 A. $\frac{d^2 y}{d^2 x}$ B. $\frac{dy^2}{dx^2}$
 C. $\frac{d^2 y}{dx^2}$ D. $\frac{dy^2}{d^2 x}$
33. $\int 10 dx = \dots\dots\dots + c$
 A. 10 B. $-10x$
 C. $10x$ D. -10
33. $\int 10 dx = \dots\dots\dots + c$
 A. 10 B. $-10x$
 C. $10x$ D. -10
34. $\int (\sin^2(x) + \cos^2(x)) dx = \dots\dots\dots + c$
 A. $\cos^2(x)$ B. $\sin^2(x)$
 C. x D. 1
34. $\int (\sin^2(x) + \cos^2(x)) dx = \dots\dots\dots + c$
 A. $\cos^2(x)$ B. $\sin^2(x)$
 C. x D. 1
35. $\int \frac{1}{8-x^2} dx = \dots\dots\dots + c$
 A. $\frac{1}{2 \cdot 8} \log\left(\left|\frac{x+8}{x-8}\right|\right)$ B. $\frac{1}{2 \cdot \sqrt{8}} \log\left(\left|\frac{x+\sqrt{8}}{x-\sqrt{8}}\right|\right)$
 C. $\frac{1}{2 \cdot 8} \log\left(\left|\frac{x-8}{x+8}\right|\right)$ D. $\frac{1}{2 \cdot \sqrt{8}} \log\left(\left|\frac{\sqrt{8}-x}{\sqrt{8}+x}\right|\right)$
34. $\int \frac{1}{8-x^2} dx = \dots\dots\dots + c$
 A. $\frac{1}{2 \cdot 8} \log\left(\left|\frac{x+8}{x-8}\right|\right)$ B. $\frac{1}{2 \cdot \sqrt{8}} \log\left(\left|\frac{x+\sqrt{8}}{x-\sqrt{8}}\right|\right)$
 C. $\frac{1}{2 \cdot 8} \log\left(\left|\frac{x-8}{x+8}\right|\right)$ D. $\frac{1}{2 \cdot \sqrt{8}} \log\left(\left|\frac{\sqrt{8}-x}{\sqrt{8}+x}\right|\right)$
36. $\int \tan(x) dx = \dots\dots\dots + c$
 A. $\log(|\sec(x)|)$ B. $\log(|\sin(x)|)$
 C. $\sec^2(x)$ D. $-\sec^2(x)$
35. $\int \tan(x) dx = \dots\dots\dots + c$
 A. $\log(|\sec(x)|)$ B. $\log(|\sin(x)|)$
 C. $\sec^2(x)$ D. $-\sec^2(x)$
37. $\int \frac{1}{x^2+25} dx = \dots\dots\dots + c$
 A. $\frac{1}{5} \tan^{-1}\left(\frac{x}{5}\right)$ B. $\frac{1}{5} \cot^{-1}\left(\frac{x}{5}\right)$
 C. $\frac{1}{25} \tan^{-1}\left(\frac{x}{25}\right)$ D. $\frac{1}{25} \cot^{-1}\left(\frac{x}{25}\right)$
39. $\int \frac{1}{x^2+25} dx = \dots\dots\dots + c$
 A. $\frac{1}{5} \tan^{-1}\left(\frac{x}{5}\right)$ B. $\frac{1}{5} \cot^{-1}\left(\frac{x}{5}\right)$

38. C. $\frac{1}{25} \tan^{-1} \left(\frac{x}{25} \right)$
 $\int \left(\frac{3}{7} \right)^x dx = \dots\dots\dots + c$
A. $\left(\frac{3}{7} \right)^x \cdot \log \left(\frac{3}{7} \right)$
B. $\frac{\left(\frac{3}{7} \right)^x}{\log \left(\frac{3}{7} \right)}$
C. $x \cdot \left(\frac{3}{7} \right)^{x-1}$
D. $\frac{3}{7}$
39. C. $\frac{1}{25} \cot^{-1} \left(\frac{x}{25} \right)$
 $\int \left(\frac{3}{7} \right)^x dx = \dots\dots\dots + c$
A. $\left(\frac{3}{7} \right)^x \cdot \log \left(\frac{3}{7} \right)$
B. $\frac{\left(\frac{3}{7} \right)^x}{\log \left(\frac{3}{7} \right)}$
C. $x \cdot \left(\frac{3}{7} \right)^{x-1}$
D. $\frac{3}{7}$
39. $\int \frac{3x^2 + 2}{x} dx = \dots\dots\dots + c$
A. $3x^2 + 2\log(x)$
B. $\frac{3}{2}x^2 + 2\log(x)$
C. $x^2 + \log(x)$
D. $\frac{3}{2}x + 2\log(x)$
39. $\int \frac{3x^2 + 2}{x} dx = \dots\dots\dots + c$
A. $3x^2 + 2\log(x)$
B. $\frac{3}{2}x^2 + 2\log(x)$
C. $x^2 + \log(x)$
D. $\frac{3}{2}x + 2\log(x)$
40. $\int \frac{\log x}{x} dx = \dots\dots\dots + c$
A. $\frac{\log x}{x}$
B. $\frac{\log x^2}{2}$
C. $\frac{\log x}{x^2}$
D. $\frac{(\log x)^2}{2}$
40. $\int \frac{\log x}{x} dx = \dots\dots\dots + c$
A. $\frac{\log x}{x}$
B. $\frac{\log x^2}{2}$
C. $\frac{\log x}{x^2}$
D. $\frac{(\log x)^2}{2}$
41. $\int \frac{1}{x \log x} dx = \dots\dots\dots + c$
A. $\log(\log x)$
B. $\log x$
C. $2\log(\log x)$
D. $\log x$
41. $\int \frac{1}{x \log x} dx = \dots\dots\dots + c$
A. $\log(\log x)$
B. $\log x$
C. $2\log(\log x)$
D. $\log x$
42. $\int_1^1 \operatorname{Cosec}(5x) dx = \dots\dots\dots$
A. 1
B. -1
C. ∞
D. 0
42. $\int_1^1 \operatorname{Cosec}(5x) dx = \dots\dots\dots$
A. 1
B. -1
C. ∞
D. 0
43. $\int_{10}^{10} \frac{1}{2023+x^3} dx = \dots\dots\dots$

- A. 1
C. ∞
83. $\int_{10}^{10} \frac{1}{2023+x^3} dx = \dots\dots\dots$
- A. 1
C. ∞
44. The region bounded by X-axis, Y-axis and a line $x + y = 2$ is a
- A. Ellipse
C. Parabola
88. X-અક્ષ, Y-અક્ષ અને રેખા $x + y = 2$ વડે ઘેરાયેલ બંધ પ્રદેશ છે.
- A. ઉપવલય
C. પરવલય
45. $\int e^x (\sin x + \cos x) dx = \dots\dots\dots + c$
- A. $\sin x$
C. $e^x \sin x$
84. $\int e^x (\sin x + \cos x) dx = \dots\dots\dots + c$
- A. $\sin x$
C. $e^x \sin x$
46. $\int_{\pi}^{\pi} \cot(\pi/2) dx = \dots\dots\dots$
- A. 0
C. ∞
86. $\int_{\pi}^{\pi} \cot(\pi/2) dx = \dots\dots\dots$
- A. 0
C. ∞
47. Find order of the following differential equation: $\frac{d^2y}{dx^2} = \left[3 + \left(\frac{dy}{dx} \right)^2 \right]^{\frac{3}{2}}$
- A. 1
C. 3
89. વિકલ સમીકરણ $\frac{d^2y}{dx^2} = \left[3 + \left(\frac{dy}{dx} \right)^2 \right]^{\frac{3}{2}}$ ની કક્ષા શોધો.
- A. 1
C. 3
48. Find degree of the following differential equation: $\frac{d^2y}{dx^2} = \left[3 + \left(\frac{dy}{dx} \right)^2 \right]^{\frac{3}{2}}$
- A. 1
C. 3
88. વિકલ સમીકરણ $\frac{d^2y}{dx^2} = \left[3 + \left(\frac{dy}{dx} \right)^2 \right]^{\frac{3}{2}}$ નું પરિમાણ શોધો.
- A. 1
C. 3
49. Which of the following is a differential equation?
- A. $\frac{dy}{dx} = \sin(y)$
C. $y = \sin(y)$
88. નીચેનામાંથી કયું વિકલ સમીકરણ છે?
- A. $\frac{dy}{dx} = \sin(y)$
C. $y = \sin(y)$
50. What is the order of the following differential equation $L \frac{di}{dt} + Ri = E \sin(\omega t)$?
- A. 0
C. 1
- B. -1
D. 0
- B. -1
D. 0
- B. Triangle
D. Circle
- B. ત્રિકોણ
D. વર્તુળ
- B. $\cos x$
D. $e^x \cos x$
- B. $\cos x$
D. $e^x \cos x$
- B. -1
D. 1
- B. -1
D. 1
- B. 2
D. 0
- B. 2
D. 0
- B. 2
D. 0
- B. $x^2 - y^2 = 1$
D. $x^2 + y^2 = 1$
- B. $x^2 - y^2 = 1$
D. $x^2 + y^2 = 1$

૫૦. વિકલ સમીકરણ $L \frac{di}{dt} + Ri = E \sin(\omega t)$ ની કક્ષા શું છે?
- A. 0 B. -1
C. 1 D. 2
51. The degree of the differential equation $\frac{dy}{dx} + \cos\left(\frac{dy}{dx}\right) = 0$ is
- A. 1 B. 2
C. -1 D. not defined
૫૧. વિકલ સમીકરણ $\frac{dy}{dx} + \cos\left(\frac{dy}{dx}\right) = 0$ નું પરિમાણ છે
- A. 1 B. 2
C. -1 D. અવ્યાખ્યાયિત
52. A differential equation of system of linear equations: $y = mx + c$ (m and c are constants)
- A. $\frac{d^2y}{dx^2} = m$ B. $\frac{d^2y}{dx^2} = 0$
C. $\frac{dy}{dx} = c$ D. $\frac{dy}{dx} = 0$
૫૨. સમીકરણ સંહતી $y = mx + c$ (જ્યાં m અને c સ્વૈર અચળ)નું વિકલ સમીકરણ શોધો
- A. $\frac{d^2y}{dx^2} = m$ B. $\frac{d^2y}{dx^2} = 0$
C. $\frac{dy}{dx} = c$ D. $\frac{dy}{dx} = 0$
53. Which of the following is not a differential equation?
- A. $\left(\frac{y}{x}\right)^2 - \frac{y^2}{2} = 0$ B. $\frac{dy}{dx} - \frac{y^2}{2} = \sin(y)$
C. $\left(\frac{dy}{dx}\right)^2 - \frac{y^2}{2} = 0$ D. $y' - y = \tan(x)$
૫૩. નીચેનામાંથી કયું વિકલ સમીકરણ નથી?
- A. $\left(\frac{y}{x}\right)^2 - \frac{y^2}{2} = 0$ B. $\frac{dy}{dx} - \frac{y^2}{2} = \sin(y)$
C. $\left(\frac{dy}{dx}\right)^2 - \frac{y^2}{2} = 0$ D. $y' - y = \tan(x)$
54. Which of the following is a linear differential equation?
- A. $\frac{dy}{dx} + y^2 = c$ B. $y \frac{dy}{dx} + xy^2 = y$
C. $\frac{dy}{dx} + xy^2 = \sin x$ D. $\frac{dy}{dx} + xy^2 = y$
૫૪. નીચેનામાંથી કયું સુરેખ વિકલ સમીકરણ છે?
- A. $\frac{dy}{dx} + y^2 = c$ B. $y \frac{dy}{dx} + xy^2 = y$
C. $\frac{dy}{dx} + xy^2 = \sin x$ D. $\frac{dy}{dx} + xy^2 = y$
55. Which of the following is not a linear differential equation?
- A. $\frac{dy}{dx} + y = \sin x$ B. $\frac{dy}{dx} + \tan x \cdot y = \operatorname{Cosec} x$
C. $\frac{dy}{dx} + xy^2 = y \cdot \sin x$ D. $\frac{dy}{dx} + y = 2$
૫૫. નીચેનામાંથી કયું સુરેખ વિકલ સમીકરણ નથી?
- A. $\frac{dy}{dx} + y = \sin x$ B. $\frac{dy}{dx} + \tan x \cdot y = \operatorname{Cosec} x$
C. $\frac{dy}{dx} + xy^2 = y \cdot \sin x$ D. $\frac{dy}{dx} + y = 2$
56. Which of the following is not a variable separable form of differential equation?
- A. $\frac{dy}{dx} + xy = 0$ B. $\frac{dy}{dx} + \tan x \cdot y = y \cdot \operatorname{Cosec} x$
C. $\frac{dy}{dx} + y^2 = y \cdot \sin x$ D. $\frac{dy}{dx} + xy = 2x$
૫૬. નીચેનામાંથી કયું વિયોજનીય પ્રકારનું વિકલ સમીકરણ નથી?

- A. $\frac{dy}{dx} + xy = 0$ B. $\frac{dy}{dx} + \tan x \cdot y = y \cdot \operatorname{Cosec} x$
 C. $\frac{dy}{dx} + y^2 = y \cdot \sin x$ D. $\frac{dy}{dx} + xy = 2x$
57. The integrating factor of the differential equation $\frac{dy}{dx} + y = x$ is
- A. x B. e^x
 C. xe^x D. ex
૫૭. વિકલ સમીકરણ $\frac{dy}{dx} + y = x$ નો સંકલ્પ કારક અવયવ (I.F.) છે.
- A. x B. e^x
 C. xe^x D. ex
58. The solution of a differential equation $\frac{dy}{dx} - y = 0$ is
- A. $y = \sin x$ B. $y = e$
 C. $y = -e^x$ D. $y = e^x$
૫૮. વિકલ સમીકરણ $\frac{dy}{dx} - y = 0$ નો ઉકેલ છે.
- A. $y = \sin x$ B. $y = e$
 C. $y = -e^x$ D. $y = e^x$
59. If $z = 2 + i3$, then $\bar{z} = \dots\dots\dots$
- A. $2 + i3$ B. $2 - i3$
 C. $\frac{2}{13} + i \frac{3}{13}$ D. $\frac{2}{13} - i \frac{3}{13}$
૫૯. જો $z = 2 + i3$, તો $\bar{z} = \dots\dots\dots$
- A. $2 + i3$ B. $2 - i3$
 C. $\frac{2}{13} + i \frac{3}{13}$ D. $\frac{2}{13} - i \frac{3}{13}$
60. If $z = 4 - i3$, then $|z| = \dots\dots\dots$
- A. 1 B. -1
 C. 5 D. $\sqrt{5}$
૬૦. જો $z = 4 - i3$, તો $|z| = \dots\dots\dots$
- A. 1 B. -1
 C. 5 D. $\sqrt{5}$
61. $i^{16} = \dots\dots\dots$
- A. i B. $-i$
 C. 1 D. -1
૬૧. $i^{16} = \dots\dots\dots$
- A. i B. $-i$
 C. 1 D. -1
62. $(\cos(\theta) + i \sin(\theta))^2 + (\cos(\theta) + i \sin(\theta))^{-2} = \dots\dots\dots$
- A. $2 \sin(2\theta)$ B. $2 \cos(2\theta)$
 C. $2i \sin(2\theta)$ D. $2i \cos(2\theta)$
૬૨. $(\cos(\theta) + i \sin(\theta))^2 + (\cos(\theta) + i \sin(\theta))^{-2} = \dots\dots\dots$
- A. $2 \sin(2\theta)$ B. $2 \cos(2\theta)$
 C. $2i \sin(2\theta)$ D. $2i \cos(2\theta)$
63. $(\cos(3\theta) + i \sin(3\theta))^{-6} = \dots\dots\dots$
- A. $\cos(18\theta) + i \sin(18\theta)$ B. $\cos(9\theta) + i \sin(9\theta)$
 C. $\cos(18\theta) - i \sin(18\theta)$ D. $\cos(9\theta) - i \sin(9\theta)$
૬૩. $(\cos(3\theta) + i \sin(3\theta))^{-6} = \dots\dots\dots$
- A. $\cos(18\theta) + i \sin(18\theta)$ B. $\cos(9\theta) + i \sin(9\theta)$
 C. $\cos(18\theta) - i \sin(18\theta)$ D. $\cos(9\theta) - i \sin(9\theta)$
64. Find the value of x and y from the following equation $(2y - 5) + i(4 - 2x) = 0$
- A. $x = 2, y = \frac{5}{2}$ B. $x = 2, y = \frac{-5}{2}$
 C. $x = -2, y = \frac{5}{2}$ D. $x = -2, y = \frac{-5}{2}$

૬૪. સમીકરણ $(2y - 5) + i(4 - 2x) = 0$ માંથી x અને y ની કિંમત શોધો.
- A. $x = 2, y = \frac{5}{2}$ B. $x = 2, y = \frac{-5}{2}$
 C. $x = -2, y = \frac{5}{2}$ D. $x = -2, y = \frac{-5}{2}$
65. What is the inverse of the complex number $1 + i2$?
- A. $\frac{1}{5} + i\frac{2}{5}$ B. $\frac{2}{5} - i\frac{1}{5}$
 C. $\frac{2}{5} + i\frac{1}{5}$ D. $\frac{1}{5} - i\frac{2}{5}$
૬૫. સંકર સંખ્યા $1 + i2$ ની વ્યસ્ત સંકર સંખ્યા શું થાય?
- A. $\frac{1}{5} + i\frac{2}{5}$ B. $\frac{2}{5} - i\frac{1}{5}$
 C. $\frac{2}{5} + i\frac{1}{5}$ D. $\frac{1}{5} - i\frac{2}{5}$
66. $i^{17} + i^{18} + i^{19} + i^{20} = \dots\dots\dots$
- A. 2 B. $2i$
 C. $-2i$ D. 0
૬૬. $i^{17} + i^{18} + i^{19} + i^{20} = \dots\dots\dots$
- A. 2 B. $2i$
 C. $-2i$ D. 0
67. The principal argument (θ) of the complex number $-1 + i$ is $\dots\dots\dots$
- A. $\frac{\pi}{4}$ B. $\frac{3\pi}{4}$
 C. $-\frac{\pi}{4}$ D. $-\frac{3\pi}{4}$
૬૭. સંકર સંખ્યા $-1 + i$ નો મુખ્ય કોણાંક $\dots\dots\dots$ થાય.
- A. $\frac{\pi}{4}$ B. $\frac{3\pi}{4}$
 C. $-\frac{\pi}{4}$ D. $-\frac{3\pi}{4}$
68. If $|z| = 16$, then $|\bar{z}| = \dots\dots\dots$
- A. 16 B. -16
 C. 4 D. -4
૬૮. જો $|z| = 16$, તો $|\bar{z}| = \dots\dots\dots$
- A. 16 B. -16
 C. 4 D. -4
69. $\sqrt{-16} = \dots\dots\dots$
- A. -4 B. $-4i$
 C. $4i$ D. -4
૬૯. $\sqrt{-16} = \dots\dots\dots$
- A. -4 B. $-4i$
 C. $4i$ D. -4
70. $\frac{2}{1+i} = \dots\dots\dots$
- A. $1 + i$ B. $1 - i$
 C. i D. $-i$
૭૦. $\frac{2}{1+i} = \dots\dots\dots$
- A. $1 + i$ B. $1 - i$
 C. i D. $-i$
