

**GUJARAT TECHNOLOGICAL UNIVERSITY**  
**DIPLOMA ENGINEERING – SEMESTER-C to D Bridge Course EXAMINATION –**  
**Winter- 2019**

**Subject Code: C300001**  
**Subject Name: Basic Mathematics**  
**Time: 02:30 PM TO 04:00 PM**

**Date: 01-01-2020**

**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.  $\log_2 8 = \underline{\hspace{2cm}}$ .  
 A. 2 B. 8  
 C. 3 D. 4
૧.  $\log_2 8 = \underline{\hspace{2cm}}$ .  
 A. 2 B. 8  
 C. 3 D. 4
2. If  $\log_x 125 = 3$  then  $x = \underline{\hspace{2cm}}$ .  
 A. 2 B. 5  
 C. 3 D. 0
૨. જો  $\log_x 125 = 3$  હોય તો,  $x = \underline{\hspace{2cm}}$ .  
 A. 2 B. 5  
 C. 3 D. 0
3. If  $\log_x 3 = 1$  then  $x = \underline{\hspace{2cm}}$ .  
 A. 1 B. 2  
 C. 3 D. 0
૩. જો  $\log_x 3 = 1$  હોય તો,  $x = \underline{\hspace{2cm}}$ .  
 A. 1 B. 2  
 C. 3 D. 0
4.  $\log_2 16 - \log_2 4 = \underline{\hspace{2cm}}$ .  
 A. 1 B. 2  
 C. 12 D. 4
૪.  $\log_2 16 - \log_2 4 = \underline{\hspace{2cm}}$ .  
 A. 1 B. 2  
 C. 12 D. 4
5.  $\log_2 3 * \log_3 2 = \underline{\hspace{2cm}}$ .  
 A. 1 B. 2  
 C. 6 D. 5
૫.  $\log_2 3 * \log_3 2 = \underline{\hspace{2cm}}$ .  
 A. 1 B. 2  
 C. 6 D. 5
6.  $\log_4 \left(\frac{1}{64}\right) = \underline{\hspace{2cm}}$ .

- A. 1  
C.  $\frac{1}{3}$   
 $\log_4\left(\frac{1}{64}\right) = \underline{\hspace{2cm}}$ .
6. A. 1  
C.  $\frac{1}{3}$   
If  $\log_3(\log_2 x) = 1$  then,  $x = \underline{\hspace{2cm}}$ .
7. **A.** 8  
C. 6  
ଋଣି  $\log_3(\log_2 x) = 1$  ଓଡ଼ିଏ ନି,  $x = \underline{\hspace{2cm}}$ .
8. **A.**  $\log_e a \log_e b$   
**C.**  $\log_e(ab)$   
 $\log_e a + \log_e b = \underline{\hspace{2cm}}$ .
9. **A.** 8  
C. 6  
 $\log_e a + \log_e b = \underline{\hspace{2cm}}$ .
10. A.  $\log_e a \log_e b$   
**C.**  $\log_e(ab)$   
 $3^{\log_3 1} = \underline{\hspace{2cm}}$ .
11. A. 3  
C. 6  
 $3^{\log_3 1} = \underline{\hspace{2cm}}$ .
12. A. 3  
C. 6  
 $\log_e\left(\frac{a^2}{bc}\right) - \log_e\left(\frac{ac}{b^2}\right) + \log_e\left(\frac{c^2}{ab}\right) = \underline{\hspace{2cm}}$ .
13. **A.** 0  
C.  $\log_e(abc)$   
 $\log_e\left(\frac{a^2}{bc}\right) - \log_e\left(\frac{ac}{b^2}\right) + \log_e\left(\frac{c^2}{ab}\right) = \underline{\hspace{2cm}}$ .
14. **A.** 0  
C.  $\log_e(abc)$   
If  $\left| \begin{matrix} x & 1 \\ 2 & 4 \end{matrix} \right| = 0$  then,  $x = \underline{\hspace{2cm}}$ .
15. A. 2  
C.  $\frac{1}{2}$   
ଋଣି  $\left| \begin{matrix} x & 1 \\ 2 & 4 \end{matrix} \right| = 0$  ଓଡ଼ିଏ ନି,  $x = \underline{\hspace{2cm}}$ .
16. A. 2  
C.  $\frac{1}{2}$   
Value of  $\left| \begin{matrix} \log_{12} 4 & -1 \\ \log_{12} 3 & 1 \end{matrix} \right|$  is =  $\underline{\hspace{2cm}}$ .
17. A. 3  
C. 4  
ନିମ୍ନଲିଖିତ  $\left| \begin{matrix} \log_{12} 4 & -1 \\ \log_{12} 3 & 1 \end{matrix} \right|$  ନି କିମ୍ପା =  $\underline{\hspace{2cm}}$ .
18. A. 3  
C. 4  
Value of  $\left| \begin{matrix} \operatorname{cosec} \theta & \cot \theta \\ \cot \theta & \operatorname{cosec} \theta \end{matrix} \right|$  is =  $\underline{\hspace{2cm}}$ .
19. A. 2  
C. 4  
Value of  $\left| \begin{matrix} \operatorname{cosec} \theta & \cot \theta \\ \cot \theta & \operatorname{cosec} \theta \end{matrix} \right|$  is =  $\underline{\hspace{2cm}}$ .
- B. -4  
**D.** -3  
B. -4  
**D.** -3  
B. 2  
D. 5  
B. 2  
D. 5  
B.  $\log_b a$   
D.  $\log_e(a+b)$   
B.  $\log_b a$   
D.  $\log_e(a+b)$   
B. 0  
D. 1  
B. 0  
D. 1  
B. 1  
D.  $2\log_e(abc)$   
B. 1  
D.  $2\log_e(abc)$   
B. 0  
**D.** 1  
B. 0  
**D.** 1  
B. 7  
**D.** 1  
B. 7  
**D.** 1  
B. 0

13. **C.** 1  
 નિશ્ચાયક  $\begin{vmatrix} \operatorname{cosec}\theta & \cot\theta \\ \cot\theta & \operatorname{cosec}\theta \end{vmatrix}$  ની કિંમત = \_\_\_\_\_.  
 A. 2  
 B. 0  
 D. -1
14. **C.** 1  
 Value of  $\begin{vmatrix} 1 & 2 & 0 \\ 4 & 5 & 0 \\ 7 & 8 & 0 \end{vmatrix}$  is = \_\_\_\_\_.  
 A. 21  
 B. 0  
 C. 13  
 D. -1
15. **C.** 13  
 નિશ્ચાયક  $\begin{vmatrix} 1 & 2 & 0 \\ 4 & 5 & 0 \\ 7 & 8 & 0 \end{vmatrix}$  ની કિંમત = \_\_\_\_\_.  
 A. 21  
 B. 0  
 C. 13  
 D. -1
16. **B.** 0  
 Order of  $\begin{bmatrix} 2 & 4 & -2 \\ 3 & 0 & -1 \end{bmatrix}$  is = \_\_\_\_\_.  
 A.  $1 \times 3$   
 B.  $2 \times 3$   
 C.  $3 \times 2$   
 D.  $1 \times 2$
17. **B.**  $2 \times 3$   
 શ્રેણિક  $\begin{bmatrix} 2 & 4 & -2 \\ 3 & 0 & -1 \end{bmatrix}$  ની કક્ષા = \_\_\_\_\_.  
 A.  $1 \times 3$   
 B.  $2 \times 3$   
 C.  $3 \times 2$   
 D.  $1 \times 2$
18. **B.**  $2 \times 3$   
 Order of  $[0 \ 0 \ 0 \ 0]$  is = \_\_\_\_\_.  
 A.  $1 \times 4$   
 B.  $2 \times 2$   
 C.  $4 \times 1$   
 D.  $4 \times 4$
19. **B.**  $2 \times 2$   
 શ્રેણિક  $[0 \ 0 \ 0 \ 0]$  ની કક્ષા = \_\_\_\_\_.  
 A.  $1 \times 4$   
 B.  $2 \times 2$   
 C.  $4 \times 1$   
 D.  $4 \times 4$
20. **C.**  $4 \times 1$   
 $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$  is a \_\_\_\_\_ matrix.  
 A. Zero  
 B. Unit  
 C. Row  
 D. Column
21. **B.** Unit  
 શ્રેણિક  $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$  એ \_\_\_\_\_ શ્રેણિક છે.  
 A. શૂન્ય  
 B. એકમ  
 C. હાર  
 D. સ્તંભ
22. **B.** એકમ  
 If  $A$  is symmetric matrix then  $A =$  \_\_\_\_\_.  
 A.  $-A$   
 B.  $A^T$   
 C.  $I$   
 D.  $-A^T$
23. **B.**  $A^T$   
 જો શ્રેણિક  $A$  સંમીત શ્રેણિક હોય તો,  $A =$  \_\_\_\_\_.  
 A.  $-A$   
 B.  $A^T$   
 C.  $I$   
 D.  $-A^T$
24. **B.**  $A^T$   
 If  $A = \begin{bmatrix} 1 & 3 \\ 0 & -2 \end{bmatrix}$ , and  $B = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ , then,  $A + B =$  \_\_\_\_\_.  
 A.  $\begin{bmatrix} 2 & 3 \\ 0 & -1 \end{bmatrix}$   
 B.  $\begin{bmatrix} 2 & 3 \\ 0 & 3 \end{bmatrix}$   
 C.  $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$   
 D.  $\begin{bmatrix} 2 & 3 \\ 0 & 2 \end{bmatrix}$
25. **A.**  $\begin{bmatrix} 2 & 3 \\ 0 & -1 \end{bmatrix}$   
 જો  $A = \begin{bmatrix} 1 & 3 \\ 0 & -2 \end{bmatrix}$ , અને  $B = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ , હોય તો,  $A + B =$  \_\_\_\_\_.  
 A.  $\begin{bmatrix} 2 & 3 \\ 0 & -1 \end{bmatrix}$   
 B.  $\begin{bmatrix} 2 & 3 \\ 0 & 3 \end{bmatrix}$

C.  $\begin{bmatrix} 0 & 0 \\ 0 & 0 \end{bmatrix}$  D.  $\begin{bmatrix} 2 & 3 \\ 0 & 2 \end{bmatrix}$

If  $A = \begin{bmatrix} 1 & 3 \\ 0 & -2 \end{bmatrix}$ ,  $B = \begin{bmatrix} 1 & -2 \\ 0 & 2 \end{bmatrix}$  then,  $2A - 3B =$  \_\_\_\_\_.

20. A.  $\begin{bmatrix} 2 & 3 \\ 0 & 3 \end{bmatrix}$  B.  $\begin{bmatrix} 2 & 3 \\ 0 & -1 \end{bmatrix}$   
**C.**  $\begin{bmatrix} -1 & 12 \\ 0 & -10 \end{bmatrix}$  D.  $\begin{bmatrix} -1 & 12 \\ 0 & 10 \end{bmatrix}$

જો  $A = \begin{bmatrix} 1 & 3 \\ 0 & -2 \end{bmatrix}$ ,  $B = \begin{bmatrix} 1 & -2 \\ 0 & 2 \end{bmatrix}$  હોય તો,  $2A - 3B =$  \_\_\_\_\_.

૨૦. A.  $\begin{bmatrix} 2 & 3 \\ 0 & 3 \end{bmatrix}$  B.  $\begin{bmatrix} 2 & 3 \\ 0 & -1 \end{bmatrix}$   
**C.**  $\begin{bmatrix} -1 & 12 \\ 0 & -10 \end{bmatrix}$  D.  $\begin{bmatrix} -1 & 12 \\ 0 & 10 \end{bmatrix}$

If  $A = \begin{bmatrix} 0 & -3 \\ 2 & -1 \\ 3 & -2 \end{bmatrix}$  then,  $A^T =$  \_\_\_\_\_.

21. A.  $\begin{bmatrix} 0 & -3 \\ 2 & -1 \\ 3 & -2 \end{bmatrix}$  B.  $\begin{bmatrix} 0 & 3 \\ -2 & 1 \\ -3 & 2 \end{bmatrix}$   
**C.**  $\begin{bmatrix} 0 & 2 & 3 \\ -3 & -1 & -2 \end{bmatrix}$  D.  $\begin{bmatrix} 0 & 2 & -3 \\ -3 & -1 & -2 \end{bmatrix}$

જો  $A = \begin{bmatrix} 0 & -3 \\ 2 & -1 \\ 3 & -2 \end{bmatrix}$  હોય તો,  $A^T =$  \_\_\_\_\_.

૨૧. A.  $\begin{bmatrix} 0 & -3 \\ 2 & -1 \\ 3 & -2 \end{bmatrix}$  B.  $\begin{bmatrix} 0 & 3 \\ -2 & 1 \\ -3 & 2 \end{bmatrix}$   
**C.**  $\begin{bmatrix} 0 & 2 & 3 \\ -3 & -1 & -2 \end{bmatrix}$  D.  $\begin{bmatrix} 0 & 2 & -3 \\ -3 & -1 & -2 \end{bmatrix}$

If  $A_{3 \times 2}$  and  $B_{2 \times 2}$  then, numbers of elements in  $A \times B$  is = \_\_\_\_\_.

22. A. 0 B. 5  
**C.** 4 **D.** 6

જો  $A_{3 \times 2}$  અને  $B_{2 \times 2}$  હોય તો,  $A \times B$  ના ઘટકોની સંખ્યા = \_\_\_\_\_.

૨૨. A. 0 B. 5  
**C.** 4 **D.** 6

If  $A_{3 \times 3}$  and  $B_{3 \times 1}$  then, order of the matrix  $A \times B$  is = \_\_\_\_\_.

23. A.  $1 \times 3$  B.  $2 \times 3$   
**C.**  $3 \times 1$  D.  $1 \times 2$

જો  $A_{3 \times 3}$  અને  $B_{3 \times 1}$  હોય તો, શ્રેણિક  $A \times B$  ની કક્ષા = \_\_\_\_\_.

૨૩. A.  $1 \times 3$  B.  $2 \times 3$   
**C.**  $3 \times 1$  D.  $1 \times 2$

If  $A$  is singular matrix then, \_\_\_\_\_.

24. A.  $A = A^T$  B.  $|A| = 0$   
**C.**  $A = -A^T$  **D.**  $A = I$

જો  $A$  અસામાન્ય શ્રેણિક હોય તો, \_\_\_\_\_.

૨૪. A.  $A = A^T$  B.  $|A| = 0$   
**C.**  $A = -A^T$  **D.**  $A = I$

25. If  $A = \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$ , then  $A^4 =$  \_\_\_\_\_.

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

B.  $\begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}$

C.  $\begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$

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

જો  $A = \begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$ , હોય તો,  $A^4 =$ \_\_\_\_\_.

૨૫.

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

B.  $\begin{bmatrix} 1 & -1 \\ 1 & 1 \end{bmatrix}$

C.  $\begin{bmatrix} 1 & 0 \\ 1 & 1 \end{bmatrix}$

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

If  $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$  then,  $adj(A) =$ \_\_\_\_\_.

26.

**A.**  $ad - bc$

B.  $a - b$

C.  $bc - ad$

D. 0

જો  $A = \begin{bmatrix} a & b \\ c & d \end{bmatrix}$  હોય તો,  $adj(A) =$ \_\_\_\_\_.

૨૬.

**A.**  $ad - bc$

B.  $a - b$

C.  $bc - ad$

D. 0

If for square matrix  $A$ ,  $A^2 - A - I = 0$  then  $A^{-1} =$ \_\_\_\_\_.

27.

A.  $A - I$

B.  $A + I$

C.  $I - A$

**D.**  $I$

ચોરસ શ્રેણિક  $A$  માટે, જો  $A^2 - A - I = 0$  હોય તો,  $A^{-1} =$ \_\_\_\_\_.

૨૭.

A.  $A - I$

B.  $A + I$

C.  $I - A$

**D.**  $I$

Solution of the system of equation  $2x + 3y = 5$  and  $2x - 3y = -1$  is =\_\_\_\_\_.

28.

A.  $(1, -2)$

B.  $(1, 2)$

C.  $(1, -1)$

**D.**  $(1, 1)$

સમીકરણ સંહિતિ  $2x + 3y = 5$  અને  $2x - 3y = -1$  નો ઉકેલ =\_\_\_\_\_.

૨૮.

A.  $(1, -2)$

B.  $(1, 2)$

C.  $(1, -1)$

**D.**  $(1, 1)$

$\frac{2\pi}{3} =$ \_\_\_\_\_ degree.

29.

A. 210

**B.** 120

C. 360

D. 240

$\frac{2\pi}{3} =$ \_\_\_\_\_ અંશ.

૨૯.

A. 210

**B.** 120

C. 360

D. 240

$45^\circ =$ \_\_\_\_\_ radian.

30.

A.  $\frac{\pi}{3}$

B.  $\frac{\pi}{2}$

C.  $\frac{\pi}{6}$

**D.**  $\frac{\pi}{4}$

$45^\circ =$ \_\_\_\_\_ રેડિયન.

૩૦.

A.  $\frac{\pi}{3}$

B.  $\frac{\pi}{2}$

C.  $\frac{\pi}{6}$

**D.**  $\frac{\pi}{4}$

$\cos\left(\frac{\pi}{2}\right) \cdot \sin\left(\frac{\pi}{3}\right) \cdot \cos\left(\frac{\pi}{4}\right) =$ \_\_\_\_\_.

31.

A. 2

**B.** 0

C. 1

D. -1

$\cos\left(\frac{\pi}{2}\right) \cdot \sin\left(\frac{\pi}{3}\right) \cdot \cos\left(\frac{\pi}{4}\right) =$ \_\_\_\_\_.

૩૧.

A. 2

**B.** 0

C. 1

D. -1

- $\cos\left(\frac{3\pi}{2} - \theta\right) = \underline{\hspace{2cm}}$ .
32. A.  $\cos \theta$  B.  $-\cos \theta$   
C.  $\sin \theta$  **D.**  $-\sin \theta$
- $\cos\left(\frac{3\pi}{2} - \theta\right) = \underline{\hspace{2cm}}$ .
32. A.  $\cos \theta$  B.  $-\cos \theta$   
C.  $\sin \theta$  **D.**  $-\sin \theta$
- If  $\pi < \theta < \frac{3\pi}{2}$  then, the trigonometric ratio which is positive is  $= \underline{\hspace{2cm}}$ .
33. A.  $\cos \theta$  **B.**  $\tan \theta$   
C.  $\sin \theta$  D. All
- જો  $\pi < \theta < \frac{3\pi}{2}$  હોય તો, ત્રિકોણમિતિય ગુણોત્તર  $\underline{\hspace{2cm}}$  ધન છે.
33. A.  $\cos \theta$  **B.**  $\tan \theta$   
C.  $\sin \theta$  D. All
- $\sin^2 21^\circ + \sin^2 69^\circ = \underline{\hspace{2cm}}$ .
34. A. 2 B. 0  
**C.** 1 D. -1
- $\sin^2 21^\circ + \sin^2 69^\circ = \underline{\hspace{2cm}}$ .
34. A. 2 B. 0  
C. -1 **D.** 1
- $\sin^{-1}\left(\frac{-1}{\sqrt{2}}\right) = \underline{\hspace{2cm}}$ .
35. **A.**  $-\frac{\pi}{4}$  B.  $\frac{\pi}{2}$   
C.  $\frac{\pi}{6}$  D.  $\frac{\pi}{4}$
- $\sin^{-1}\left(\frac{-1}{\sqrt{2}}\right) = \underline{\hspace{2cm}}$ .
35. **A.**  $-\frac{\pi}{4}$  B.  $\frac{\pi}{2}$   
C.  $\frac{\pi}{6}$  D.  $\frac{\pi}{4}$
- $\sin^{-1}\left(\frac{-1}{\sqrt{2}}\right) = \underline{\hspace{2cm}}$ .
34. **A.**  $-\frac{\pi}{4}$  B.  $\frac{\pi}{2}$   
C.  $\frac{\pi}{6}$  D.  $\frac{\pi}{4}$
- If  $\cos \theta = \frac{4}{5}$  then,  $\sin \theta = \underline{\hspace{2cm}}$ .
36. A.  $\frac{4}{5}$  **B.**  $\frac{3}{5}$   
C.  $\frac{5}{4}$  D.  $\frac{5}{3}$
- જો  $\cos \theta = \frac{4}{5}$  હોય તો,  $\sin \theta = \underline{\hspace{2cm}}$ .
36. A.  $\frac{4}{5}$  **B.**  $\frac{3}{5}$   
C.  $\frac{5}{4}$  D.  $\frac{5}{3}$
- $\sin \alpha \cos \beta + \cos \alpha \sin \beta = \underline{\hspace{2cm}}$ .
37. A.  $\sin(\alpha - \beta)$  B.  $\cos(\alpha - \beta)$   
C.  $\cos(\alpha + \beta)$  **D.**  $\sin(\alpha + \beta)$
- $\sin \alpha \cos \beta + \cos \alpha \sin \beta = \underline{\hspace{2cm}}$ .
37. A.  $\sin(\alpha - \beta)$  B.  $\cos(\alpha - \beta)$   
C.  $\cos(\alpha + \beta)$  **D.**  $\sin(\alpha + \beta)$
- $1 - 2\sin^2 \theta = \underline{\hspace{2cm}}$ .
38. A.  $\sin 2\theta$  **B.**  $\cos 2\theta$   
C.  $\tan 2\theta$  D.  $2\sin \theta$
- $1 - 2\sin^2 \theta = \underline{\hspace{2cm}}$ .
38. A.  $\sin 2\theta$  **B.**  $\cos 2\theta$   
C.  $\tan 2\theta$  D.  $2\sin \theta$
- $1 - 2\sin^2 \theta = \underline{\hspace{2cm}}$ .
38. A.  $\sin 2\theta$  **B.**  $\cos 2\theta$   
C.  $\tan 2\theta$  D.  $2\sin \theta$
- If  $A + B = \frac{\pi}{4}$  then,  $\tan(A + B) = \underline{\hspace{2cm}}$ .
39. A. -1 B. 0  
**C.** 1 D.  $\infty$
- જો  $A + B = \frac{\pi}{4}$  હોય તો,  $\tan(A + B) = \underline{\hspace{2cm}}$ .
39. A. -1 B. 0  
**C.** 1 D.  $\infty$
- $\tan(A + B) = \underline{\hspace{2cm}}$ .
39. A. -1 B. 0  
**C.** 1 D.  $\infty$
39. A. -1 B. 0  
**C.** 1 D.  $\infty$

- $\tan(A - B) = \underline{\hspace{2cm}}$ .
40. A.  $\frac{\tan A - \tan B}{1 - \tan A \tan B}$  **B.**  $\frac{\tan A - \tan B}{1 + \tan A \tan B}$   
 C.  $\frac{\tan A + \tan B}{1 + \tan A \tan B}$  D.  $\frac{\tan A + \tan B}{1 - \tan A \tan B}$
- $\tan(A - B) = \underline{\hspace{2cm}}$ .
୪୦. A.  $\frac{\tan A - \tan B}{1 - \tan A \tan B}$  **B.**  $\frac{\tan A - \tan B}{1 + \tan A \tan B}$   
 C.  $\frac{\tan A + \tan B}{1 + \tan A \tan B}$  D.  $\frac{\tan A + \tan B}{1 - \tan A \tan B}$
- $\tan^{-1}\left(\frac{2}{11}\right) + \tan^{-1}\left(\frac{7}{24}\right) = \underline{\hspace{2cm}}$ .
41. A.  $\tan^{-1}\left(\frac{7}{24}\right)$  B.  $\tan^{-1}\left(\frac{11}{24}\right)$   
**C.**  $\tan^{-1}\left(\frac{1}{2}\right)$  D.  $\tan^{-1}\left(\frac{24}{11}\right)$
- $\tan^{-1}\left(\frac{2}{11}\right) + \tan^{-1}\left(\frac{7}{24}\right) = \underline{\hspace{2cm}}$ .
୪୧. A.  $\tan^{-1}\left(\frac{7}{24}\right)$  B.  $\tan^{-1}\left(\frac{11}{24}\right)$   
**C.**  $\tan^{-1}\left(\frac{1}{2}\right)$  D.  $\tan^{-1}\left(\frac{24}{11}\right)$
- The principal period of  $\sin 2x = \underline{\hspace{2cm}}$ .
42. A.  $\pi$  B.  $3\pi$   
**C.**  $2\pi$  D. 2
- $\sin 2x$  ର ମୁଖ୍ୟ ଆବର୍ତ୍ତମାନ =  $\underline{\hspace{2cm}}$ .
୪୨. A.  $\pi$  B.  $3\pi$   
**C.**  $2\pi$  D. 2
- $2\sin\left(\frac{5\pi}{12}\right)\cos\left(\frac{7\pi}{12}\right) = \underline{\hspace{2cm}}$ .
43. A. 1 B. 0  
 C.  $\frac{1}{2}$  **D.**  $-\frac{1}{2}$
- $2\sin\left(\frac{5\pi}{12}\right)\cos\left(\frac{7\pi}{12}\right) = \underline{\hspace{2cm}}$ .
୪୩. A. 1 B. 0  
 C.  $\frac{1}{2}$  **D.**  $-\frac{1}{2}$
- $\cos\left(\pi + \cos^{-1}\frac{3}{5}\right) = \underline{\hspace{2cm}}$ .
44. A.  $\frac{3}{5}$  **B.**  $-\frac{3}{5}$   
 C.  $\frac{1}{2}$  D.  $-\frac{1}{2}$
- $\cos\left(\pi + \cos^{-1}\frac{3}{5}\right) = \underline{\hspace{2cm}}$ .
୪୪. A.  $\frac{3}{5}$  **B.**  $-\frac{3}{5}$   
 C.  $\frac{1}{2}$  D.  $-\frac{1}{2}$
- The principal period of  $\tan x = \underline{\hspace{2cm}}$ .
45. **A.**  $\pi$  B.  $3\pi$   
 C.  $2\pi$  D. 2
- $\tan x$  ର ମୁଖ୍ୟ ଆବର୍ତ୍ତମାନ =  $\underline{\hspace{2cm}}$ .
୪୫. **A.**  $\pi$  B.  $3\pi$   
 C.  $2\pi$  D. 2
- $\cot(225^\circ) = \underline{\hspace{2cm}}$ .
46. **A.** 1 B. 0  
 C. -1 D.  $-\frac{1}{2}$
- $\cot(225^\circ) = \underline{\hspace{2cm}}$ .
୪୬. **A.** 1 B. 0  
 C. -1 D.  $-\frac{1}{2}$
- $|2i - 4j + 4k| = \underline{\hspace{2cm}}$ .
47. A. 1 B. 2  
**C.** 6 D. 10
- $|2i - 4j + 4k| = \underline{\hspace{2cm}}$ .
୪୭. A. 1 B. 2

C. 6 D. 10

If  $\bar{x} = (3, 2, 1)$  and  $y = (-1, 3, 2)$  then  $\bar{x} - \bar{y} =$  \_\_\_\_\_.

48. A. (2, 5, 3) B. (2, -1, -1)  
C. (4, 5, 3) D. (4, -1, 3)

જો  $\bar{x} = (3, 2, 1)$  અને  $y = (-1, 3, 2)$  હોય તો,  $\bar{x} - \bar{y} =$  \_\_\_\_\_.

૪૮. A. (2, 5, 3) B. (2, -1, -1)  
C. (4, 5, 3) D. (4, -1, 3)

Unit vector in the direction of  $\bar{a} = (0, -1, 0)$  is = \_\_\_\_\_.

49. A. (0, -1, 0) B. (0, 1, 0)  
C. (1, 1, 1) D. (1, 0, 0)

સદિશ  $\bar{a} = (0, -1, 0)$  ની દિશામાં એકમ સદિશ = \_\_\_\_\_.

૪૯. A. (0, -1, 0) B. (0, 1, 0)  
C. (1, 1, 1) D. (1, 0, 0)

If  $\bar{x} = (1, 0, 0)$  and  $\bar{y} = (0, 0, 1)$  then  $\bar{x} \cdot \bar{y} =$  \_\_\_\_\_.

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

જો  $\bar{x} = (1, 0, 0)$  અને  $\bar{y} = (0, 0, 1)$  હોય તો,  $\bar{x} \cdot \bar{y} =$  \_\_\_\_\_.

૫૦. A. 1 B. 2  
C. 0 D. -1  
 $i \times j =$  \_\_\_\_\_.

51. A.  $i \cdot j$  B.  $j \times i$   
C.  $k$  D.  $-k$   
 $i \times j =$  \_\_\_\_\_.

૫૧. A.  $i \cdot j$  B.  $j \times i$   
C.  $k$  D.  $-k$

If  $\bar{x} = \bar{i} + 3\bar{j} - 2\bar{k}$  and  $\bar{y} = 4\bar{i} - 2\bar{j} - \bar{k}$  then angle between  $\bar{x}$  and  $\bar{y}$  is = \_\_\_\_\_.

52. A.  $\pi$  B. 0  
C.  $\frac{\pi}{2}$  D.  $\frac{\pi}{3}$

જો  $\bar{x} = \bar{i} + 3\bar{j} - 2\bar{k}$  અને  $\bar{y} = 4\bar{i} - 2\bar{j} - \bar{k}$  હોય તો,  $\bar{x}$  અને  $\bar{y}$  વચ્ચેનો ખૂણો = \_\_\_\_\_.

૫૨. A.  $\pi$  B. 0  
C.  $\frac{\pi}{2}$  D.  $\frac{\pi}{3}$

If vector  $\bar{x} = 2\bar{i} + 3\bar{j} - \bar{k}$  and  $\bar{y} = a\bar{i} - \bar{j} + 3\bar{k}$  are perpendicular to each other then  $a =$  \_\_\_\_\_.

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

જો સદિશ  $\bar{x} = 2\bar{i} + 3\bar{j} - \bar{k}$  અને સદિશ  $\bar{y} = a\bar{i} - \bar{j} + 3\bar{k}$  પરસ્પર લંબ હોય તો,  $a =$  \_\_\_\_\_.

૫૩. A. 3 B. 2  
C. 0 D. -1

If  $\bar{x} \times \bar{y} = \bar{i} - 2\bar{j} - 2\bar{k}$  then  $\bar{y} \times \bar{x} =$  \_\_\_\_\_.

54. A.  $\bar{i} - 2\bar{j} - 2\bar{k}$  B.  $-\bar{i} + 2\bar{j} - 2\bar{k}$   
C.  $\bar{i} + 2\bar{j} + 2\bar{k}$  D.  $-\bar{i} + 2\bar{j} + 2\bar{k}$

જો  $\bar{x} \times \bar{y} = \bar{i} - 2\bar{j} - 2\bar{k}$  હોય તો,  $\bar{y} \times \bar{x} =$  \_\_\_\_\_.

૫૪. A.  $\bar{i} - 2\bar{j} - 2\bar{k}$  B.  $-\bar{i} + 2\bar{j} - 2\bar{k}$   
C.  $\bar{i} + 2\bar{j} + 2\bar{k}$  D.  $-\bar{i} + 2\bar{j} + 2\bar{k}$

55. If the vector  $\bar{x} = \bar{i} + \bar{j} - 2\bar{k}$  and  $\bar{y} = \bar{i} - 2\bar{j} + \bar{k}$  represents two adjacent sides of



parallelogram, then the area of the parallelogram =\_\_\_\_\_.

- A. 0 B.  $\sqrt{50}$   
C. 7 D.  $\sqrt{27}$

જો સદિશો  $\vec{x} = \vec{i} + \vec{j} - 2\vec{k}$  અને  $\vec{y} = \vec{i} - 2\vec{j} + \vec{k}$  સમાંતરબાજુ ચતુષ્કોણની પાસેપાસેની બાજુઓ દર્શાવે તો, સમાંતરબાજુ ચતુષ્કોણનું ક્ષેત્રફળ =\_\_\_\_\_.

૫૫. A. 0 B.  $\sqrt{50}$   
C. 7 D.  $\sqrt{27}$

If  $\vec{x} = (1, 0, 0)$  and  $\vec{y} = (0, 0, 1)$  then vector perpendicular to  $\vec{x}$  and  $\vec{y}$  both is =\_\_\_\_\_.

56. A. (0, -1, 0) B. (0, 1, 0)  
C. (1, 0, 1) D. (1, 0, 0)

જો  $\vec{x} = (1, 0, 0)$  અને  $\vec{y} = (0, 0, 1)$  હોય તો,  $\vec{x}$  અને  $\vec{y}$  ને પરસ્પર લંબ સદિશ =\_\_\_\_\_.

૫૬. A. (0, -1, 0) B. (0, 1, 0)  
C. (1, 0, 1) D. (1, 0, 0)

If  $\vec{x} = (2, 1, 1)$  and  $\vec{y} = (1, -1, 2)$  then, Direction cosines of  $\vec{x} - 2\vec{y}$  =\_\_\_\_\_.

57. A.  $\frac{1}{\sqrt{18}}(0, -1, -3)$  B.  $\frac{1}{\sqrt{18}}(0, 3, -3)$   
C.  $\frac{1}{\sqrt{18}}(0, -3, 3)$  D.  $\frac{1}{\sqrt{27}}(3, -3, 3)$

જો  $\vec{x} = (2, 1, 1)$  અને  $\vec{y} = (1, -1, 2)$  હોય તો,  $\vec{x} - 2\vec{y}$  નાં દિક-કોસાઈન =\_\_\_\_\_.

૫૭. A.  $\frac{1}{\sqrt{18}}(0, -1, -3)$  B.  $\frac{1}{\sqrt{18}}(0, 3, -3)$   
C.  $\frac{1}{\sqrt{18}}(0, -3, 3)$  D.  $\frac{1}{\sqrt{27}}(3, -3, 3)$

Force  $\vec{F} = (5, 1, 0)$  acts on a particle and the particle moves from  $(2, 1, -3)$  to  $(4, -3, 7)$  then, total work done =\_\_\_\_\_.

58. A. 3 B. 24  
C. 0 D. 6

બળ  $\vec{F} = (5, 1, 0)$  ની અસર હેઠળ કણ  $(2, 1, -3)$  થી  $(4, -3, 7)$  સુધી સ્થાનાંતર કરે છે તો, કુલ થયેલ કાર્ય =\_\_\_\_\_.

૫૮. A. 3 B. 24  
C. 0 D. 6

A particle moves from the point  $2\vec{i} - \vec{j} - 3\vec{k}$  to the point  $4\vec{i} - 3\vec{j} + 7\vec{k}$  under the effect of forces  $3\vec{i} + 2\vec{j} + 3\vec{k}$  and  $2\vec{i} + \vec{j} - 3\vec{k}$  then, total work done =\_\_\_\_\_.

59. A. 4 B. 2  
C. 14 D. 6

એક કણ પર  $3\vec{i} + 2\vec{j} + 3\vec{k}$  અને  $2\vec{i} + \vec{j} - 3\vec{k}$  બળો લાગતા, તે બિંદુ  $2\vec{i} - \vec{j} - 3\vec{k}$  થી બિંદુ  $4\vec{i} - 3\vec{j} + 7\vec{k}$  તરફ સ્થાનાંતર કરે તો, કુલ થયેલ કાર્ય =\_\_\_\_\_.

૫૯. A. 4 B. 2  
C. 14 D. 6

The area of the equilateral triangle, whose sides are  $a$  cm is =\_\_\_\_\_.

60. A.  $4a^2$  B.  $a^2$   
C.  $\frac{4a^2}{\sqrt{3}}$  D.  $\frac{\sqrt{3}a^2}{4}$

જેની બાજુનું માપ  $a$  cm હોય, તેવા સમબાજુ ત્રિકોણનું ક્ષેત્રફળ =\_\_\_\_\_.

૬૦. A.  $4a^2$  B.  $a^2$   
C.  $\frac{4a^2}{\sqrt{3}}$  D.  $\frac{\sqrt{3}a^2}{4}$

The area of the circle with radius 7 cm is =\_\_\_\_\_  $cm^2$ .

61. A. 14 B. 154  
C. 49 D. 164

7 cm ત્રિજયવાળા વર્તુળનું ક્ષેત્રફળ =\_\_\_\_\_  $cm^2$ .

૬૧. A. 14 B. 154  
C. 49 D. 164

- Curved surface area of the cylinder with radius 1 cm and height 7 cm is = \_\_\_\_  $cm^2$ .
62. A. 14 B. 22  
C. 44 D. 154
- 1 cm ત્રિજ્યા અને 7 cm ઊંચાઈવાળા નળાકારની વક્રસપાટીનું ક્ષેત્રફળ = \_\_\_\_  $cm^2$ .
૬૨. A. 14 B. 22  
C. 44 D. 154
- Surface area of the cuboids is = \_\_\_\_.
63. A.  $l+b+h$  B.  $lh+bl+hb$   
C.  $2(lh+bl+hb)$  D.  $lbh$
- લંબઘનનું પૃષ્ઠફળ = \_\_\_\_.
૬૩. A.  $l+b+h$  B.  $lh+bl+hb$   
C.  $2(lh+bl+hb)$  D.  $lbh$
- If perimeter of the square is 12 cm then the area of the square is = \_\_\_\_  $cm^2$ .
64. A. 3 B. 12  
C. 9 D. 24
- જો ચોરસની પરીમીતી 12 cm હોય તો, ચોરસનું ક્ષેત્રફળ = \_\_\_\_  $cm^2$ .
૬૪. A. 3 B. 12  
C. 9 D. 24
- Volume of the cone with radius 3 cm and height 7 cm is = \_\_\_\_  $cm^3$ .
65. A. 66 B. 22  
C. 44 D. 154
- 3 cm ત્રિજ્યા અને 7 cm ઊંચાઈવાળા શંકુનું ઘનફળ = \_\_\_\_  $cm^3$ .
૬૫. A. 66 B. 22  
C. 44 D. 154
- Volume of the sphere whose radius is  $r$  = \_\_\_\_.
66. A.  $\pi r^3$  B.  $\frac{2}{3}\pi r^3$   
C.  $\frac{4}{3}\pi r^3$  D.  $\frac{2}{3}\pi r^2$
- $r$  ત્રિજ્યાવાળા ગોલકનું ઘનફળ = \_\_\_\_.
૬૬. A.  $\pi r^3$  B.  $\frac{2}{3}\pi r^3$   
C.  $\frac{4}{3}\pi r^3$  D.  $\frac{2}{3}\pi r^2$
- Curved surface area of the hemisphere is = \_\_\_\_.
67. A.  $2\pi r^2$  B.  $3\pi r^2$   
C.  $4\pi r^3$  D.  $4\pi r^2$
- અર્ધગોલકની વક્રસપાટીનું ક્ષેત્રફળ = \_\_\_\_.
૬૭. A.  $2\pi r^2$  B.  $3\pi r^2$   
C.  $4\pi r^3$  D.  $4\pi r^2$
- $1 m^3 =$  \_\_\_\_ litre.
68. A. 1 B. 1000  
C. 100 D. 10
- $1 m^3 =$  \_\_\_\_ લિટર.
૬૮. A. 1 B. 1000  
C. 100 D. 10
- Area of the triangle whose sides are 3 cm, 4 cm and 5 cm is = \_\_\_\_  $cm^2$ .
69. A. 1 B. 12  
C. 6 D. 16
- જેની બાજુઓ ના માપ 3 cm, 4 cm અને 5 cm હોય તેવા ત્રિકોણનું ક્ષેત્રફળ = \_\_\_\_  $cm^2$ .
૬૯. A. 1 B. 12  
C. 6 D. 16
- A tank of length 1m, breadth 2m and height 5m can store \_\_\_\_\_ litre water.
70. A. 10 B. 11

30. 1m લંબાઈ, 2m પહોળી અને 5m ઊંચી ટાંકીમાં \_\_\_\_\_ લિટર પાણી સમાય.
- C. 8  
A. 10  
B. 11  
D. 16

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