

# GUJARAT TECHNOLOGICAL UNIVERSITY

Diploma Engineering – SEMESTER – 1(CtoD) – EXAMINATION – Winter-2025

Subject Code: C300001

Date: 31-01-2026

Subject Name: Basic Mathematics

Time: 10:30 AM TO 12:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make Suitable assumptions wherever necessary.
3. Use of simple calculators and non-programmable scientific calculators are permitted.
4. English version is authentic.
5. Use only OMR to answer this question paper.
6. Each question is of 1 mark.
7. There is No negative marking.

1.  $\log_5 2 + \log_5 3 = \underline{\hspace{2cm}}$ .

A. 6

B.  $\log_{25} 6$

C.  $\log_5 (2+3)$

D.  $\log_5 6$

૧.  $\log_5 2 + \log_5 3 = \underline{\hspace{2cm}}$ .

A. 6

B.  $\log_{25} 6$

C.  $\log_5 (2+3)$

D.  $\log_5 6$

2.  $A = \begin{bmatrix} 1 & 2 \\ 0 & 3 \end{bmatrix}$ , then  $A + I = \underline{\hspace{2cm}}$ .

A.  $\begin{bmatrix} 2 & 2 \\ 0 & 4 \end{bmatrix}$

B.  $\begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$

C.  $\begin{bmatrix} 0 & 4 \\ 2 & 2 \end{bmatrix}$

D.  $\begin{bmatrix} 0 & 4 \\ 1 & 2 \end{bmatrix}$

૨.  $A = \begin{bmatrix} 1 & 2 \\ 0 & 3 \end{bmatrix}$  તો  $A + I = \underline{\hspace{2cm}}$

A.  $\begin{bmatrix} 2 & 2 \\ 0 & 4 \end{bmatrix}$

B.  $\begin{bmatrix} 2 & 1 \\ 1 & 2 \end{bmatrix}$

C.  $\begin{bmatrix} 0 & 4 \\ 2 & 2 \end{bmatrix}$

D.  $\begin{bmatrix} 0 & 4 \\ 1 & 2 \end{bmatrix}$

3.  $\log x^5 \div \log x = \underline{\hspace{2cm}}$ .

A. 5

B.  $\log x^4$

C.  $\log 4x$

D. 4

3.  $\log x^5 \div \log x = \underline{\hspace{2cm}}$ .

A. 5

B.  $\log x^4$

C.  $\log 4x$

D. 4

4. If A is non singular matrix then \_\_\_\_\_.

A.  $A = A^T$

B.  $|A| = 0$

C.  $|A| \neq 0$

D.  $A = -A^T$

૪. જો A સામાન્ય શ્રેણિક હોય તો \_\_\_\_\_.  
 A.  $A = A^T$  B.  $|A| = 0$   
 C.  $|A| \neq 0$  D.  $A = -A^T$
5. Period of the function  $\cos x$  is \_\_\_\_\_.  
 A.  $4\pi$  B.  $2\pi$   
 C.  $\pi$  D.  $\pi/2$
૫.  $\cos x$  નું અવર્તમાન \_\_\_\_\_ થાય .  
 A.  $4\pi$  B.  $2\pi$   
 C.  $\pi$  D.  $\pi/2$
6.  $180^\circ =$  \_\_\_\_\_ radian.  
 A.  $3\pi/2$  B.  $\pi/2$   
 C.  $\pi$  D.  $2\pi$
૬.  $180^\circ =$  \_\_\_\_\_ રેડીયન .  
 A.  $3\pi/2$  B.  $\pi/2$   
 C.  $\pi$  D.  $2\pi$
7. If  $\begin{vmatrix} x & 5 \\ 3 & 5 \end{vmatrix} = 5$  then  $x =$  \_\_\_\_\_.  
 A. 5 B. 0  
 C. 4 D. 1
9.  $\begin{vmatrix} x & 5 \\ 3 & 5 \end{vmatrix} = 5$  હોય તો  $x =$  \_\_\_\_\_.  
 A. 5 B. 0  
 C. 4 D. 1
8. For  $A = \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}$ ,  $A^T =$  \_\_\_\_\_.  
 A.  $\begin{bmatrix} 1 & 0 \\ 3 & 1 \end{bmatrix}$  B.  $\begin{bmatrix} -1 & 0 \\ 3 & 1 \end{bmatrix}$   
 C.  $\begin{bmatrix} 1 & 0 \\ -3 & 1 \end{bmatrix}$  D.  $\begin{bmatrix} -1 & 3 \\ 0 & 1 \end{bmatrix}$
૮. જો  $A = \begin{bmatrix} 1 & 3 \\ 0 & 1 \end{bmatrix}$  હોય તો  $A^T =$  \_\_\_\_\_.  
 A.  $\begin{bmatrix} 1 & 0 \\ 3 & 1 \end{bmatrix}$  B.  $\begin{bmatrix} -1 & 0 \\ 3 & 1 \end{bmatrix}$   
 C.  $\begin{bmatrix} 1 & 0 \\ -3 & 1 \end{bmatrix}$  D.  $\begin{bmatrix} -1 & 3 \\ 0 & 1 \end{bmatrix}$
9. Volume of the sphere with radius 6 cm is \_\_\_\_\_ cm. cube.  
 A.  $132\pi$  B.  $72\pi$   
 C.  $288\pi$  D.  $36\pi$
૯. 6 સેમી ત્રિજ્યા વાળા ગોળાકાનું ઘનફળ \_\_\_\_\_ ઘન સેમી થાય.  
 A.  $132\pi$  B.  $72\pi$   
 C.  $288\pi$  D.  $36\pi$
10. If for matrix A,  $A + A^T = 0$  then A is \_\_\_\_\_ matrix.  
 A. Diagonal B. Symmetric  
 C. Skew-symmetric D. None of these
૧૦. જો શ્રેણિક A માટે  $A + A^T = 0$  હોય તો A \_\_\_\_\_ શ્રેણિક છે.  
 A. વિકર્ણ B. સંમિત

- C. વિસંમિત
11.  $\cos(2\pi + \theta) = \underline{\hspace{2cm}}$ .
- A.  $\cos \theta$
- C.  $\sin \theta$
૧૧.  $\cos(2\pi + \theta) = \underline{\hspace{2cm}}$ .
- A.  $\cos \theta$
- C.  $\sin \theta$
12.  $\frac{1}{\log_3 21} = \underline{\hspace{2cm}}$ .
- A.  $\log_7 3$
- C.  $\log_7 21$
૧૨.  $\frac{1}{\log_3 21} = \underline{\hspace{2cm}}$ .
- A.  $\log_7 3$
- C.  $\log_7 21$
13.  $\log_2 8 = \underline{\hspace{2cm}}$ .
- A. 0
- C. 2
૧૩.  $\log_2 8 = \underline{\hspace{2cm}}$ .
- A. 0
- C. 2
14.  $\pi/6$  radian =  $\underline{\hspace{2cm}}$  degree.
- A.  $180^\circ$
- C.  $120^\circ$
૧૪.  $\pi/6$  રેડીયન =  $\underline{\hspace{2cm}}$  ડિગ્રી.
- A.  $180^\circ$
- C.  $120^\circ$
15.  $\begin{vmatrix} 1 & 2 & 1 \\ 3 & 3 & 2 \\ 2 & 1 & 1 \end{vmatrix} = \underline{\hspace{2cm}}$ .
- A. 2
- C. 0
૧૫.  $\begin{vmatrix} 1 & 2 & 1 \\ 3 & 3 & 2 \\ 2 & 1 & 1 \end{vmatrix} = \underline{\hspace{2cm}}$ .
- A. 2
- C. 0
16. Area of a square with length 6 cm is  $\underline{\hspace{2cm}}$  sq. Cm.
- A. 10
- C. 12
૧૬. 6 સેમી લંબાઈ વાળા ચોરસનું ક્ષેત્રફળ  $\underline{\hspace{2cm}}$  ચો. સેમી થાય.
- A. 10
- C. 12
17. Order of the matrix  $A = \begin{bmatrix} 1 & 3 & -1 & 2 \\ 2 & 4 & 2 & 4 \end{bmatrix}$  is  $\underline{\hspace{2cm}}$ .
- A. 3x3
- C. 2x4
- D. આમાંનું એક પણ નહિ
- B.  $-\cos \theta$
- D.  $-\sin \theta$
- B.  $-\cos \theta$
- D.  $-\sin \theta$
- B.  $\log_3 7$
- D.  $\log_{21} 3$
- B.  $\log_3 7$
- D.  $\log_{21} 3$
- B. 1
- D. 3
- B. 1
- D. 3
- B.  $30^\circ$
- D.  $60^\circ$
- B.  $30^\circ$
- D.  $60^\circ$
- B. 3
- D. 1
- B. 36
- D. 6
- B. 36
- D. 6
- B. 3x2
- D. 4x2

૧૭.  $A = \begin{bmatrix} 1 & 3 & -1 & 2 \\ 2 & 4 & 2 & 4 \end{bmatrix}$  હોય તો A નો ક્રમ \_\_\_\_ છે.
- A. 3x3 B. 3x2  
C. 2x4 D. 4x2
18.  $\log_{16} 1 = \underline{\hspace{1cm}}$ .
- A. 1 B. 16  
C. 4 D. 0
૧૮.  $\log_{16} 1 = \underline{\hspace{1cm}}$ .
- A. 1 B. 16  
C. 4 D. 0
19. If  $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$  then  $\text{adj } A = \underline{\hspace{1cm}}$ .
- A. A B. 0  
C. I D. -A
૧૯. જો  $A = \begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$  હોય તો  $\text{adj } A = \underline{\hspace{1cm}}$ .
- A. A B. 0  
C. I D. -A
20.  $\log_5 5 = \underline{\hspace{1cm}}$
- A. 5 B. 25  
C. 1 D. 0
૨૦.  $\log_5 5 = \underline{\hspace{1cm}}$
- A. 5 B. 25  
C. 1 D. 0
21.  $\cos^2 \theta - \sin^2 \theta = \underline{\hspace{1cm}}$ .
- A. 0 B.  $\cos 2\theta$   
C. 1 D.  $\sin 2\theta$
૨૧.  $\cos^2 \theta - \sin^2 \theta = \underline{\hspace{1cm}}$ .
- A. 0 B.  $\cos 2\theta$   
C. 1 D.  $\sin 2\theta$
22. Formula for area of circle is \_\_\_\_.
- A.  $\pi r^2$  B.  $2\pi rh$   
C.  $2\pi r^2$  D.  $2\pi r$
૨૨. વર્તુળનું ક્ષેત્રફળ શોધવા માટેનું સૂત્ર \_\_\_\_ છે.
- A.  $\pi r^2$  B.  $2\pi rh$   
C.  $2\pi r^2$  D.  $2\pi r$
23.  $\sin 3\theta = \underline{\hspace{1cm}}$ .
- A.  $3\sin \theta - \sin^3 \theta$  B.  $3\sin \theta - 4\sin^3 \theta$   
C.  $\sin \theta - 4\sin^3 \theta$  D.  $3\sin 3\theta - 4\sin^3 \theta$
૨૩.  $\sin 3\theta = \underline{\hspace{1cm}}$ .
- A.  $3\sin \theta - \sin^3 \theta$  B.  $3\sin \theta - 4\sin^3 \theta$   
C.  $\sin \theta - 4\sin^3 \theta$  D.  $3\sin 3\theta - 4\sin^3 \theta$
24. If  $A_{4 \times 3}$  and  $B_{3 \times 4}$  are two matrices then \_\_\_\_.
- A. AB is not possible B. AB is possible.  
C. A+B is possible D. A-B is possible
૨૪. જો  $A_{4 \times 3}$  અને  $B_{3 \times 4}$  હોય તો \_\_\_\_.
- A. AB શક્ય નથી B. AB શક્ય છે.  
C. A+B શક્ય છે. D. A-B શક્ય છે

25. If  $A = \begin{bmatrix} 0 & 2 \\ 0 & 3 \end{bmatrix}$  and  $B = \begin{bmatrix} 2 & 1 \\ 0 & 0 \end{bmatrix}$  then  $AB = \underline{\hspace{2cm}}$ .

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

B.  $\begin{bmatrix} 0 & 7 \\ 2 & 0 \end{bmatrix}$

C.  $\begin{bmatrix} 0 & 0 \\ 4 & 0 \end{bmatrix}$

D.  $\begin{bmatrix} 0 & 7 \\ 0 & 0 \end{bmatrix}$

૨૫. જો  $A = \begin{bmatrix} 0 & 2 \\ 0 & 3 \end{bmatrix}$  અને  $B = \begin{bmatrix} 2 & 1 \\ 0 & 0 \end{bmatrix}$  હોય તો  $AB = \underline{\hspace{2cm}}$ .

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

B.  $\begin{bmatrix} 0 & 7 \\ 2 & 0 \end{bmatrix}$

C.  $\begin{bmatrix} 0 & 0 \\ 4 & 0 \end{bmatrix}$

D.  $\begin{bmatrix} 0 & 7 \\ 0 & 0 \end{bmatrix}$

26. If  $A = \begin{bmatrix} 1 & 2 \\ 4 & x \end{bmatrix}$  and  $|A| = 10$  then  $x = \underline{\hspace{2cm}}$ .

A. -8

B. 18

C. 0

D. -4

૨૬. જો  $A = \begin{bmatrix} 1 & 2 \\ 4 & x \end{bmatrix}$  હોય અને  $|A| = 10$  હોય તો  $x = \underline{\hspace{2cm}}$ .

A. -8

B. 18

C. 0

D. -4

27. Volume of a cube is 64 cube cm then length of side is  $\underline{\hspace{2cm}}$  cm

A. 2

B. 8

C. 16

D. 4

૨૭. એક સમઘનનું ઘનફળ 64 ઘન સેમી છે, તો તેની એક બાજુની લંબાઈ  $\underline{\hspace{2cm}}$  સેમી થાય.

A. 2

B. 8

C. 16

D. 4

28.  $\sin(\alpha + \beta) = \underline{\hspace{2cm}}$ .

A.  $\sin \alpha \cos \beta + \cos \alpha \sin \beta$

B.  $\sin \alpha \cos \beta - \cos \alpha \sin \beta$

C.  $\sin \alpha \sin \beta - \cos \alpha \cos \beta$

D.  $\cos \alpha \cos \beta - \sin \alpha \sin \beta$

૨૮.  $\sin(\alpha + \beta) = \underline{\hspace{2cm}}$ .

A.  $\sin \alpha \cos \beta + \cos \alpha \sin \beta$

B.  $\sin \alpha \cos \beta - \cos \alpha \sin \beta$

C.  $\sin \alpha \sin \beta - \cos \alpha \cos \beta$

D.  $\cos \alpha \cos \beta - \sin \alpha \sin \beta$

29.  $\sqrt{\frac{1 - \cos 2\theta}{2}} = \underline{\hspace{2cm}}$ .

A.  $\sin \theta$

B.  $\tan \theta$

C.  $\cot \theta$

D.  $\cos \theta$

૨૯.  $\sqrt{\frac{1 - \cos 2\theta}{2}} = \underline{\hspace{2cm}}$ .

A.  $\sin \theta$

B.  $\tan \theta$

C.  $\cot \theta$

D.  $\cos \theta$

30.  $\log_2(\log_3 9) = \underline{\hspace{2cm}}$ .

A. 54

B. 9

C. 3

D. 1

૩૦.  $\log_2(\log_3 9) = \underline{\hspace{2cm}}$ .

A. 54

B. 9

C. 3

D. 1

31.  $\tan(\alpha + \beta) = \frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}$  \_\_\_\_\_
- A.  $\frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}$  B.  $\frac{\tan \alpha - \tan \beta}{1 - \tan \alpha \tan \beta}$
- C.  $\frac{\tan \alpha + \tan \beta}{1 + \tan \alpha \tan \beta}$  D.  $\frac{\tan \alpha + \tan \beta}{\tan \alpha \tan \beta}$
32.  $\tan(\alpha + \beta) = \frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}$  \_\_\_\_\_
- A.  $\frac{\tan \alpha + \tan \beta}{1 - \tan \alpha \tan \beta}$  B.  $\frac{\tan \alpha - \tan \beta}{1 - \tan \alpha \tan \beta}$
- C.  $\frac{\tan \alpha + \tan \beta}{\tan \alpha \tan \beta}$  D.  $\frac{\tan \alpha + \tan \beta}{\tan \alpha \tan \beta}$
33. For  $u = (1, 2, -1)$  and  $v = (2, -1, 2)$ ,  $u + 2v =$  \_\_\_\_\_.
- A.  $(2, 1, -1)$  B.  $(3, 1, 1)$
- C.  $(5, 0, 3)$  D.  $(4, 3, 0)$
34. જો  $u = (1, 2, -1)$  અને  $v = (2, -1, 2)$  હોય તો  $u + 2v =$  \_\_\_\_\_.
- A.  $(2, 1, -1)$  B.  $(3, 1, 1)$
- C.  $(5, 0, 3)$  D.  $(4, 3, 0)$
35. જો  $A = \begin{bmatrix} 8 & 1 \\ 5 & 2 \end{bmatrix}$  હોય તો  $|A| =$  \_\_\_\_\_.
- A. 21 B. 0
- C. 11 D. -11
36.  $A = \begin{bmatrix} 8 & 1 \\ 5 & 2 \end{bmatrix}$  then  $|A| =$  \_\_\_\_\_.
- A. 21 B. 0
- C. 11 D. -11
37.  $\sin 135^\circ =$  \_\_\_\_\_
- A.  $\frac{1}{2}$  B.  $\frac{1}{\sqrt{2}}$
- C. 1 D. 0
38.  $\sin 135^\circ =$  \_\_\_\_\_
- A.  $\frac{1}{2}$  B.  $\frac{1}{\sqrt{2}}$
- C. 1 D. 0
39.  $\cos\left(\sin^{-1}\left(\frac{1}{2}\right)\right) =$  \_\_\_\_\_
- A.  $\frac{1}{\sqrt{2}}$  B.  $\frac{\sqrt{3}}{2}$
- C. 1 D. 0
40.  $\cos\left(\sin^{-1}\left(\frac{1}{2}\right)\right) =$  \_\_\_\_\_
- A.  $\frac{1}{\sqrt{2}}$  B.  $\frac{\sqrt{3}}{2}$
- C. 1 D. 0
41. For vectors  $\vec{u}$  and  $\vec{v}$ , vector \_\_\_\_\_ perpendicular to both  $\vec{u}$  and  $\vec{v}$ .
- A.  $\vec{v}$  B.  $\vec{u} \times \vec{v}$
- C.  $\vec{u}$  D.  $\vec{u} + \vec{v}$
42. જો સદિશ  $\vec{u}$  અને  $\vec{v}$  માટે \_\_\_\_\_ સદિશ  $\vec{u}$  અને  $\vec{v}$  બંને ને લંબ થશે.
- A.  $\vec{v}$  B.  $\vec{u} \times \vec{v}$
- C.  $\vec{u}$  D.  $\vec{u} + \vec{v}$

37.  $\tan^{-1} x + \cot^{-1} x = \underline{\hspace{2cm}}$   
 A. 0  
 C.  $\frac{\pi}{2}$   
 B.  $\pi$   
 D.  $\frac{\pi}{3}$
39.  $\tan^{-1} x + \cot^{-1} x = \underline{\hspace{2cm}}$   
 A. 0  
 C.  $\frac{\pi}{2}$   
 B.  $\pi$   
 D.  $\frac{\pi}{3}$
38.  $\sin^{-1}(-x) = \underline{\hspace{2cm}}, x \in [-1, 1]$   
 A.  $\cos^{-1} x$   
 C.  $-\sin^{-1} x$   
 B.  $-\cos^{-1} x$   
 D.  $\sin^{-1} 2x$
36.  $\sin^{-1}(-x) = \underline{\hspace{2cm}}, x \in [-1, 1]$   
 A.  $\cos^{-1} x$   
 C.  $-\sin^{-1} x$   
 B.  $-\cos^{-1} x$   
 D.  $\sin^{-1} 2x$
39. If  $u = (1, -2, -2)$  then  $|u| = \underline{\hspace{2cm}}$ .  
 A. 1  
 C. 9  
 B. 3  
 D. 5
36. જો  $u = (1, -2, -2)$  હોય તો  $|u| = \underline{\hspace{2cm}}$ .  
 A. 1  
 C. 9  
 B. 3  
 D. 5
40.  $\log(x^2) - \log(y^2)$ .  
 A.  $\log\left(\frac{x^2}{y^2}\right)$   
 C. 1  
 B.  $\log\left(\frac{x}{y}\right)$   
 D. 0
- જો.  $\log(x^2) - \log(y^2)$   
 A.  $\log\left(\frac{x^2}{y^2}\right)$   
 C. 1  
 B.  $\log\left(\frac{x}{y}\right)$   
 D. 0
41. If for a matrix  $A$  and  $B$ ,  $AB = BA = I$  then  $B = \underline{\hspace{2cm}}$ .  
 A.  $A^{-1}$   
 C.  $B^{-1}$   
 B.  $A^T$   
 D.  $A$
- જો. જો  $A$  અને  $B$  માટે  $AB = BA = I$  હોય તો  $B = \underline{\hspace{2cm}}$  છે.  
 A.  $A^{-1}$   
 C.  $B^{-1}$   
 B.  $A^T$   
 D.  $A$
42.  $\begin{vmatrix} 1 & 3 \\ 1 & 8 \end{vmatrix} = \underline{\hspace{2cm}}$ .  
 A. -5  
 C. 5  
 B. 8  
 D. 3
- જો.  $\begin{vmatrix} 1 & 3 \\ 1 & 8 \end{vmatrix} = \underline{\hspace{2cm}}$ .  
 A. -5  
 C. 5  
 B. 8  
 D. 3
43. If  $A = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$  and  $B = \begin{bmatrix} 2 & 3 \end{bmatrix}$  then  $AB = \underline{\hspace{2cm}}$ .  
 A.  $\begin{bmatrix} 4 & 2 \\ 6 & 3 \end{bmatrix}$   
 B.  $[7]$

- C.  $\begin{bmatrix} 4 & 6 \end{bmatrix}$  D.  $\begin{bmatrix} 4 & 6 \\ 2 & 3 \end{bmatrix}$
૪૩. જો  $A = \begin{bmatrix} 2 \\ 1 \end{bmatrix}$  અને  $B = \begin{bmatrix} 2 & 3 \end{bmatrix}$  તો  $AB = \underline{\hspace{1cm}}$ .
- A.  $\begin{bmatrix} 4 & 2 \\ 6 & 3 \end{bmatrix}$  B.  $\begin{bmatrix} 7 \end{bmatrix}$
- C.  $\begin{bmatrix} 4 & 6 \end{bmatrix}$  D.  $\begin{bmatrix} 4 & 6 \\ 2 & 3 \end{bmatrix}$
44.  $\begin{bmatrix} 2 & 3 \end{bmatrix} = \begin{bmatrix} x & y \end{bmatrix}$  then  $x = \underline{\hspace{1cm}}, y = \underline{\hspace{1cm}}$
- A. 2,3 B. 3,2
- C. 5,0 D. 0,5
૪૪.  $\begin{bmatrix} 2 & 3 \end{bmatrix} = \begin{bmatrix} x & y \end{bmatrix}$  તો  $x = \underline{\hspace{1cm}}, y = \underline{\hspace{1cm}}$
- A. 2,3 B. 3,2
- C. 5,0 D. 0,5
45. If vectors  $\vec{u}$  and  $\vec{v}$  are parallel vectors then \_\_\_\_\_
- A.  $|\vec{u} \times \vec{v}| = 2$  B.  $|\vec{u} \times \vec{v}| = 1$
- C.  $\vec{u} \cdot \vec{v} = 0$  D.  $|\vec{u} \times \vec{v}| = 0$
૪૫. જો સદિશ  $\vec{u}$  અને  $\vec{v}$  પરસ્પર સમાંતર (parallel) હોય તો \_\_\_\_\_
- A.  $|\vec{u} \times \vec{v}| = 2$  B.  $|\vec{u} \times \vec{v}| = 1$
- C.  $\vec{u} \cdot \vec{v} = 0$  D.  $|\vec{u} \times \vec{v}| = 0$
46.  $2 \cos A \cos B = \underline{\hspace{1cm}}$
- A.  $\cos(A-B) + \cos(A+B)$  B.  $\cos(A-B) - \cos(A+B)$
- C.  $\cos(A+B) - \cos(A-B)$  D.  $-\cos(A-B) - \cos(A+B)$
૪૬.  $2 \cos A \cos B = \underline{\hspace{1cm}}$
- A.  $\cos(A-B) + \cos(A+B)$  B.  $\cos(A-B) - \cos(A+B)$
- C.  $\cos(A+B) - \cos(A-B)$  D.  $-\cos(A-B) - \cos(A+B)$
47. \_\_\_\_\_ is a unit vector.
- A. (1,3) B. (1,1)
- C. (0,1) D. (-1,2)
૪૭. \_\_\_\_\_ એકમ સદિશ છે.
- A. (1,3) B. (1,1)
- C. (0,1) D. (-1,2)
48. Radius and height of a cone is 4cm and 15cm respectively then Volume = \_\_\_\_\_
- A.  $40\pi$  B.  $80\pi$
- C.  $60\pi$  D.  $85\pi$
૪૮. એક શંકુ ની ત્રિજ્યા ૪ સેમી અને ઊંચાઈ 15 સેમી હોય તો તેનું ઘનફળ \_\_\_\_\_ ઘન સેમી થાય.
- A.  $40\pi$  B.  $80\pi$
- C.  $60\pi$  D.  $85\pi$
49. If  $u = (2, -3, 1)$  and  $v = (2, 1, 1)$  then  $u \cdot v = \underline{\hspace{1cm}}$ .
- A. 5 B. 0
- C. 1 D. 2
૪૯. જો  $u = (2, -3, 1)$  અને  $v = (2, 1, 1)$  હોય તો  $u \cdot v = \underline{\hspace{1cm}}$ .
- A. 5 B. 0
- C. 1 D. 2
50.  $\log_2 64 = \underline{\hspace{1cm}}$
- A. 6 B. 4
- C. 5 D. 3

૫૦.  $\log_2 64 = \underline{\hspace{1cm}}$

- A. 6  
C. 5

- B. 4  
D. 3

51. For  $A = \begin{bmatrix} 2 & -3 \\ 2 & 1 \end{bmatrix}$ ,  $\text{adj } A = \underline{\hspace{1cm}}$ .

- A.  $\begin{bmatrix} 1 & -3 \\ 2 & 2 \end{bmatrix}$   
C.  $\begin{bmatrix} 2 & 3 \\ -2 & 1 \end{bmatrix}$

- B.  $\begin{bmatrix} 1 & 3 \\ -2 & 2 \end{bmatrix}$   
D.  $\begin{bmatrix} -2 & -3 \\ 2 & -1 \end{bmatrix}$

૫૧. જો  $A = \begin{bmatrix} 2 & -3 \\ 2 & 1 \end{bmatrix}$  હોય તો  $\text{adj } A = \underline{\hspace{1cm}}$ .

- A.  $\begin{bmatrix} 1 & -3 \\ 2 & 2 \end{bmatrix}$   
C.  $\begin{bmatrix} 2 & 3 \\ -2 & 1 \end{bmatrix}$

- B.  $\begin{bmatrix} 1 & 3 \\ -2 & 2 \end{bmatrix}$   
D.  $\begin{bmatrix} -2 & -3 \\ 2 & -1 \end{bmatrix}$

52. If  $A = \begin{bmatrix} 1 & 3 \end{bmatrix}$  and  $B = \begin{bmatrix} 1 \\ 4 \end{bmatrix}$  then  $AB = \underline{\hspace{1cm}}$ .

- A.  $\begin{bmatrix} 3 & 9 \\ 2 & 6 \end{bmatrix}$   
C.  $\begin{bmatrix} 4 & 6 \end{bmatrix}$

- B.  $\begin{bmatrix} 3 & 2 \\ 9 & 6 \end{bmatrix}$   
D.  $\begin{bmatrix} 13 \end{bmatrix}$

૫૨. જો  $A = \begin{bmatrix} 1 & 3 \end{bmatrix}$  અને  $B = \begin{bmatrix} 1 \\ 4 \end{bmatrix}$  તો  $AB = \underline{\hspace{1cm}}$ .

- A.  $\begin{bmatrix} 3 & 9 \\ 2 & 6 \end{bmatrix}$   
C.  $\begin{bmatrix} 4 & 6 \end{bmatrix}$

- B.  $\begin{bmatrix} 3 & 2 \\ 9 & 6 \end{bmatrix}$   
D.  $\begin{bmatrix} 13 \end{bmatrix}$

53. If  $\vec{u} = 2i + 4j - k$  and  $\vec{v} = 3i - j + mk$  are perpendicular then  $m = \underline{\hspace{1cm}}$ .

- A. 2  
C. 12

- B. -2  
D. -12

૫૩. જો  $\vec{u} = 2i + 4j - k$  અને  $\vec{v} = 3i - j + mk$  લંબ સદીશો હોય તો  $m = \underline{\hspace{1cm}}$ .

- A. 2  
C. 12

- B. -2  
D. -12

54.  $\underline{\hspace{1cm}}$  is a unit vector.

- A. (1,0,1)  
C. (1,1,1)

- B. (0,3,1)  
D. (1,0,0)

૫૪.  $\underline{\hspace{1cm}}$  એકમ સદિશ છે.

- A. (1,0,1)  
C. (1,1,1)

- B. (0,3,1)  
D. (1,0,0)

55. If  $\vec{u}$  and  $\vec{v}$  are perpendicular vectors and then  $\underline{\hspace{1cm}}$ .

- A.  $\vec{u} \cdot \vec{v} = 1$   
C.  $\vec{u} \cdot \vec{v} = -1$

- B.  $\vec{u} \cdot \vec{v} = 0$   
D.  $|\vec{u} + \vec{v}|$

૫૫. જો  $\vec{u}$  અને  $\vec{v}$  એકમ લંબ સદીશો હોય તો  $\underline{\hspace{1cm}}$ .

- A.  $\vec{u} \cdot \vec{v} = 1$   
C.  $\vec{u} \cdot \vec{v} = -1$

- B.  $\vec{u} \cdot \vec{v} = 0$   
D.  $|\vec{u} + \vec{v}|$

56. Direction cosines of the vector  $(-1, -1, -1)$  are  $\underline{\hspace{1cm}}$ .

- A. -1, -1, -1  
C.  $-\frac{1}{\sqrt{3}}, -\frac{1}{\sqrt{3}}, -\frac{1}{\sqrt{3}}$

- B.  $\sqrt{3}, \sqrt{3}, \sqrt{3}$   
D. None of these.

૫૬. સદિશ (૧,૧,૧) નાં દીક્કોસાઈનો \_\_\_\_\_ છે.
- A. 1,1,1 B.  $\sqrt{3}, \sqrt{3}, \sqrt{3}$   
 C.  $\frac{-1}{\sqrt{3}}, \frac{-1}{\sqrt{3}}, \frac{-1}{\sqrt{3}}$  D. આમાંના એક પણ નહિ.
57. For  $\vec{u} = (1, 2, 1)$  and  $\vec{v} = (1, 2, 1)$  then  $\vec{u} \times \vec{v} =$  \_\_\_\_
- A. (1,2,1) B. (1,1,3)  
 C. (1,-2,1) D. (1,1,-3)
૫૭. સદિશ  $\vec{u} = (1, 2, 1)$  અને  $\vec{v} = (1, 2, 1)$  માટે  $\vec{u} \times \vec{v} =$  \_\_\_\_
- A. (1,2,1) B. (0,0,0)  
 C. (1,-2,1) D. (1,1,-3)
58.  $\vec{u} \times \vec{0} =$  \_\_\_\_
- A.  $\vec{u}$  B. 0  
 C.  $\vec{0}$  D. None of these
૫૮.  $\vec{u} \times \vec{0} =$  \_\_\_\_
- A.  $\vec{u}$  B. 0  
 C.  $\vec{0}$  D. આમાંનું એક પણ નહિ.
59. Volume of the cylinder with 5 cm radius and 2 cm height is \_\_\_\_ cube cm.
- A.  $60\pi$  B.  $50\pi$   
 C.  $720\pi$  D.  $25\pi$
૫૯. 5 સેમી ત્રિજ્યા અને ૨ સેમી ઉચાઈના નળાકારનું ઘનફળ \_\_\_\_ ઘન સેમી થાય.
- A.  $60\pi$  B.  $50\pi$   
 C.  $720\pi$  D.  $25\pi$
60. If  $a^b = c$  then \_\_\_\_.
- A.  $\log_a c = b$  B.  $\log_a b = c$   
 C.  $\log_b c = a$  D.  $\log_b a = c$
૬૦. જો  $a^b = c$  માટે \_\_\_\_\_ લખી શકાય .
- A.  $\log_a c = b$  B.  $\log_a b = c$   
 C.  $\log_b c = a$  D.  $\log_b a = c$
61. If  $\begin{bmatrix} x & 7 \\ 1 & 1 \end{bmatrix} = \begin{bmatrix} 0 & 7 \\ 1 & y \end{bmatrix}$  then  $x =$  \_\_\_\_ and  $y =$  \_\_\_\_.
- A.  $x = 0$  and  $y = 1$  B.  $x = 1$  and  $y = 1$   
 C.  $x = 0$  and  $y = 0$  D.  $x = 1$  and  $y = 0$
૬૧. જો  $\begin{bmatrix} x & 7 \\ 1 & 1 \end{bmatrix} = \begin{bmatrix} 0 & 7 \\ 1 & y \end{bmatrix}$  તો  $x =$  \_\_\_\_ અને  $y =$  \_\_\_\_.
- A.  $x = 0$  and  $y = 1$  B.  $x = 1$  and  $y = 1$   
 C.  $x = 0$  and  $y = 0$  D.  $x = 1$  and  $y = 0$
62. A matrix which contains only one column is called \_\_\_\_ matrix.
- A. Column B. Row  
 C. Square D. None of these
૬૨. એક અને માત્ર એક સ્તંભ ધરાવતા શ્રેણિકને \_\_\_\_\_ શ્રેણિક કહેવાય.
- A. સ્તંભ B. હાર  
 C. ચોરસ D. આમાંનું એક પણ નહીં
63. For  $u = (1, 0, 0)$  and  $v = (0, 0, 1)$  then angle between  $u$  and  $v$  is \_\_\_\_.
- A.  $\pi/6$  B.  $\pi/2$   
 C.  $\pi$  D.  $2\pi$
૬૩. સદીશો  $u = (1, 0, 0)$  અને  $v = (0, 0, 1)$  વચ્ચેના ખૂણાનું માપ \_\_\_\_ થાય.
- A.  $\pi/6$  B.  $\pi/2$   
 C.  $\pi$  D.  $2\pi$

64. Surface area of the cylinder with 2 cm radius and 7 cm height is \_\_\_\_ sq. cm.  
 A.  $20\pi$  B.  $30\pi$   
 C.  $28\pi$  D.  $720\pi$
૬૪. 2 સેમી ત્રિજ્યા અને ૭ સેમી ઊંચાઈ વાળા નળાકારની વક્ર સપાટીનું ક્ષેત્રફલ \_\_\_\_ ચો.સેમી થાય.  
 A.  $20\pi$  B.  $30\pi$   
 C.  $28\pi$  D.  $720\pi$
65. Volume of the sphere with diameter 6 cm is \_\_\_\_ cm. cube.  
 A.  $12\pi$  B.  $36\pi$   
 C.  $28\pi$  D.  $72\pi$
૬૫. 6 સેમી વ્યાસ વાળા ગોલાકનું ઘનફળ \_\_\_\_ ઘન સેમી થાય.  
 A.  $12\pi$  B.  $36\pi$   
 C.  $28\pi$  D.  $72\pi$
66. Area of a triangle with length of sides 3 cm, 4 cm and 5 cm is \_\_\_\_ .  
 A. 12 sq. cm B. 6 sq. cm  
 C.  $4\sqrt{7}$  sq. cm D. 8 sq. cm
૬૬. ત્રિકોણની બાજુઓનાં માપ 3 સેમી, 4 સેમી અને 5 સેમી છે, તો તેનું ક્ષેત્રફલ \_\_\_\_ થાય  
 A. 12 ચો. સેમી B. 6 ચો. સેમી  
 C.  $4\sqrt{7}$  ચો.સેમી D. 8 ચો. સેમી
67. Volume of a cube with length of side 3 cm is \_\_\_\_ cube cm.  
 A. 81 B. 27  
 C. 64 D. 9
૬૭. એક સમઘન જેની એક બાજુની લંબાઈ 3 સેમી છે, તેનું ઘનફળ \_\_\_\_ ઘન સેમી થાય.  
 A. 81 B. 27  
 C. 64 D. 9
68. Area of a circle is 154 sq. Cm then radius of the circle is \_\_\_\_ cm.  
 A. 4 B. 6  
 C. 5 D. 7
૬૮. એક વર્તુળ નું ક્ષેત્રફલ ૧૫૪ ચો. સેમી હોય તો તેની ત્રિજ્યા \_\_\_\_ સેમી થાય.  
 A. 4 B. 6  
 C. 5 D. 7
69.  $\vec{u} \cdot \vec{u} = \underline{\hspace{1cm}}$ .  
 A.  $\vec{u} \times \vec{u}$  B.  $|\vec{u}|^2$   
 C.  $|\vec{u}|\vec{u}$  D.  $\vec{u} + \vec{u}$
૬૯.  $\vec{u} \cdot \vec{u} = \underline{\hspace{1cm}}$ .  
 A.  $\vec{u} \times \vec{u}$  B.  $|\vec{u}|^2$   
 C.  $|\vec{u}|\vec{u}$  D.  $\vec{u} + \vec{u}$
70.  $\sin\pi \cdot \sin(\pi/6) + \cos(\pi/2) \cdot \sin(\pi/4) = \underline{\hspace{1cm}}$ .  
 A.  $\frac{1}{2}$  B. 1  
 C. 0 D.  $\frac{1}{\sqrt{2}}$
૭૦.  $\sin\pi \cdot \sin(\pi/6) + \cos(\pi/2) \cdot \sin(\pi/4) = \underline{\hspace{1cm}}$ .  
 A.  $\frac{1}{2}$  B. 1  
 C. 0 D.  $\frac{1}{\sqrt{2}}$

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