BASIC MATHS -QUESTION BANK

1) Solve $\begin{bmatrix} 1 & x & x2 \\ 1 & 2 & 4 \\ 1 & 3 & 9 \end{bmatrix} = 0$

2) Solve for x $\begin{bmatrix} 1 & x & x2 \\ 1 & 1 & 1 \\ 1 & 2 & 4 \end{bmatrix} = \begin{bmatrix} 2 & 1 \\ 2 & 1 \end{bmatrix}$.

3) Find Inverse of $\begin{bmatrix} 3 & 5 \\ 1 & 2 \end{bmatrix}$.

4) If A= $\begin{bmatrix} 3 & 9 \\ -1 & -9 \end{bmatrix}$ then show that A^2 is a Null matrix.

5) If A = $\begin{bmatrix} 4 & 2 \\ 8 & 4 \end{bmatrix}$ and B = $\begin{bmatrix} 2 & 6 \\ -4 & -12 \end{bmatrix}$ Show that AB is null matrix.

6) If A= $\begin{bmatrix} 1 & 2 & 3 \\ 4 & 5 & 6 \end{bmatrix}$ and B= $\begin{bmatrix} 1 \\ 9 \\ 8 \end{bmatrix}$ Evaluate AB.

7) If A= $\begin{bmatrix} 4 & 3 \\ 2 & 5 \end{bmatrix}$ Find $A2 - 9A + 14I$, Where I is unit matrix.

8) If A= $\begin{bmatrix} 2 & 5 \\ 1 & 3 \end{bmatrix}$ verify that A^2 -5A+I=0 , Where I is unit matrix.

9) Resolve in partial Fractions $\frac{x+4}{x2+x}$

10) Resolve in partial Fractions $\frac{1}{x2-x}$

11) Resolve in partial Fractions $\frac{5x+1}{(x-1).(x+2)}$

12) Solve using Cramer's Rule : x+2y=6-3z, 2y+z=7-4x, 9z+2y=14-3x

13) Solve using Cramer's Rule :x+y+z-6=0 , 2x+y-2z+2=0 , x+y-3z+6=0

14) Solve using Cramer's Rule :x+y+z =3,x-y+z=1,x+y-2z=0

15) Solve using matrix Inversion Method: x+y+z=3, 3x-2y+3z=4, 5x+5y+z=11.

16) Solve using matrix Inversion Method: x +y +z = 6, x +y -z = 2, x-y-z = 0

17) Solve using matrix Inversion Method : x +y +z = 3, x+2y+3z = 4 , x+4y+9z = 6

18) If A= $\begin{bmatrix} 2 & -3 \\ 1 & 5 \end{bmatrix}$ and B= $\begin{bmatrix} 3 & -1 & 2 \\ 1 & 0 & 1 \end{bmatrix}$ Verify that $(AB)^T = B^T A^T$

19) Find A^{-1} by Adjoint method if A= $\begin{bmatrix} 1 & 2 & 3 \\ 2 & 4 & 5 \\ 3 & 5 & 6 \end{bmatrix}$

20) Find the value of x and y if $\begin{bmatrix} 1 & 2 \\ 3 & 2 \end{bmatrix} \begin{bmatrix} x & 5 & -3 \\ 2 & y & 5 \end{bmatrix} = \begin{bmatrix} 5 & -3 & 7 \\ 7 & 7 & 1 \end{bmatrix}$

21) If $A=\begin{bmatrix}1 & 2 & -1\\ 3 & 0 & 2\\ 4 & 5 & 0\end{bmatrix}$ and $B=\begin{bmatrix}1 & 0 & 0\\ 2 & 1 & 0\\ 0 & 1 & 3\end{bmatrix}$ Verify $(AB)^T=B^T A^T$

22) If $A=\begin{bmatrix}0 & 1 & -1\\ 4 & -3 & 4\\ 3 & -3 & 4\end{bmatrix}$ prove that $A^2 = I$

23) If $A=\begin{bmatrix}2 & 3 & -1\\ 1 & 0 & 4\end{bmatrix}$ and $B=\begin{bmatrix}-3 & 7\\ -5 & 6\\ -4 & 4\end{bmatrix}$ Verify that $(AB)^T=B^T A^T$.

24)

If $A=\begin{bmatrix}2 & -2 & -4\\ -1 & 3 & 4\\ 1 & -2 & -3\end{bmatrix}$ show that $A^2=A$

25) Resolve into partial fractions $\frac{x2}{(x+1).(x-2)2}$.

26) Resolve into partial fractions $\frac{1}{(x+1)2(x+2)}$.

27) Resolve into partial fractions $\frac{(x2+23x)}{(x+3).(x2+1)}$.

28) Resolve into partial fractions $\frac{x4}{(x2-1)}$.

29) Resolve into partial fractions $\frac{(x3+x)}{(x2-9)}$.

30) Resolve into partial fractions $\frac{(x2-x+3)}{(x-2).(x2+1)}$.

31) Prove that $\cos(A-B) = \cos A \cos B + \sin A \sin B$

32) In any ΔABC, prove that $\tan A + \tan B + \tan C = \tan A \,.\, \tan B \,.\, \tan C$

33) Without using calculator ,prove that $\sin 420° \,.\, \cos 390° + \cos(-300°) \sin(-330) = 1$

34) prove that $\sin(A+B) \,.\, \sin(A-B) = cos^2 B - cos^2 A$

35) Without using calculator, find the value of

1) $\sin 150°$,
2) $\sin(-765°)$,
3) $\tan 15°$
4) $\cos 105°$