

Q. No.	<p style="text-align: center;">FYBSc Sem1 Mathematics Paper I Matrix Algebra Question Bank</p>	Ans
1)	<p>If $A = [a_{ij}]$ be a square matrix of order 3 then cofactor of $a_{13} = \dots\dots$</p> <p>(A) $A_{13} = M_{31}$ (B) $A_{13} = M_{13}$ (C) $A_{13} = -M_{13}$ (D) None of these</p>	B
2)	<p>If $A = [a_{ij}]$ be a square matrix of order 3 then cofactor of $a_{23} = \dots\dots$</p> <p>(A) $A_{23} = M_{23}$ (B) $A_{23} = M_{32}$ (C) $A_{23} = -M_{23}$ (D) None of these</p>	C
3)	<p>If A is square matrix of order n then $A \cdot adjA = \dots\dots$</p> <p>(A) A (B) $A I$ (C) I (D) None of these</p>	B
4)	<p>If A is square matrix of order n then $adjA = \dots\dots$</p> <p>(A) $A A^{-1}$ (B) A (C) A^{-1} (D) None of these</p>	A
5)	<p>If A, B are non-singular square matrices of the same order n then $adj(AB) = \dots\dots$</p> <p>(A) $adjA \cdot adjB$ (B) $adjBA$ (C) $adjB \cdot adjA$ (D) None of these</p>	C
6)	<p>If A is square matrix of order n then $adj(adjA) = \dots\dots$</p> <p>(A) $A ^{n-1}A$ (B) $A ^{n-2}A$ (C) $A ^{n-2}I$ (D) None of these</p>	B
7)	<p>If A, B are non-singular square matrices of the same order then $(AB)^{-1} = \dots\dots$</p> <p>(A) $A^{-1}B^{-1}$ (B) $B^{-1}A^{-1}$ (C) $B \cdot A$ (D) None of these</p>	B

8)	Let A be a square matrix of order n . If there exist a matrix B such that $AB = BA = I$ then (A) B is inverse of A (B) $A = B$ (C) B is not inverse of A (D) None of these	A
9)	If A is non singular matrix then $A^{-1} = \dots\dots\dots$ (A) $adjA$ (B) $ A adjA$ (C) $\frac{1}{ A }adjA$ (D) None of these	C
10)	If A is non singular matrix then $ A^{-1} = \dots\dots\dots$ (A) $ A $ (B) $- A $ (C) $\frac{1}{ A }$ (D) None of these	C
11)	If $A = \begin{bmatrix} 2 & -3 \\ 1 & 5 \end{bmatrix}$ then $A^{-1} = \dots\dots\dots$ (A) $\frac{1}{13} \begin{bmatrix} 5 & 3 \\ -1 & 2 \end{bmatrix}$ (B) $\frac{1}{7} \begin{bmatrix} 5 & 3 \\ -1 & 2 \end{bmatrix}$ (C) $\frac{1}{13} \begin{bmatrix} 5 & -3 \\ 1 & 2 \end{bmatrix}$ (D) None of these	A
12)	If $A = \begin{bmatrix} 3 & 1 \\ 4 & -2 \end{bmatrix}$ then $A^{-1} = \dots\dots\dots$ (A) $\frac{1}{10} \begin{bmatrix} -2 & -1 \\ -4 & 3 \end{bmatrix}$ (B) $\frac{1}{-10} \begin{bmatrix} -2 & -1 \\ -4 & 3 \end{bmatrix}$ (C) $\frac{1}{-10} \begin{bmatrix} -2 & 1 \\ 4 & 3 \end{bmatrix}$ (D) None of these	B
13)	If A is square matrix of order 3 and $ A = 4$ then $A \cdot adjA = \dots\dots\dots$ (A) 4 (B) $4I$ (C) I (D) None of these	B
14)	If A is square matrix of order 5 and $ A = 2$ then $ adjA = \dots\dots\dots$ (A) 32 (B) 8 (C) 16 (D) None of these	C
15)	If A is singular matrix then $A \cdot adjA = \dots\dots\dots$ (A) I (B) 0 (C) A (D) None of these	B

16)	A system of linear equations $AX = B$ is said to be homogeneous. If B is	A
	(A) Null Matrix (B) Non zero matrix (C) Singular matrix (D) None of these	
17)	A system of linear equations $AX = B$ is said to be non-homogeneous. If B is	B
	(B) Null Matrix (B) Non zero matrix (C) Singular matrix (D) None of these	
18)	A system of linear equations $AX = B$ is said to be consistent if system has	C
	(A) No solution (B) Unique solution (C) Solution (D) None of these	
19)	A system of linear equations $AX = B$ is said to be inconsistent if system has	A
	(A) No solution (B) Unique solution (C) Solution (D) None of these	
20)	A system of linear equations $AX = B$ is said to be consistent if system has	B
	(A) $\rho(A) \neq \rho(A, B)$ (B) $\rho(A) = \rho(A, B)$ (C) $\rho(A) < \rho(A, B)$ (D) None of these	
21)	A system of linear equations $AX = B$ is said to be inconsistent if system has	A
	(A) $\rho(A) \neq \rho(A, B)$ (B) $\rho(A) = \rho(A, B)$ (C) $\rho(A) < \rho(A, B)$ (D) None of these	
22)	A system of linear equations $AX = B$ of n unknowns such that $\rho(A) = \rho(A, B) = n$ then system has solution.	B
	(A) No (B) Unique (C) Infinite (D) None of these	
23)	A system of linear equations $AX = B$ of n unknowns such that $\rho(A) = \rho(A, B) < n$ then system has solution.	C
	(A) No (B) Unique (C) Infinite (D) None of these	

24)	A homogeneous system of three linear equations in three unknowns has a unique solution if	B
	(A) $ A = 0$ (B) $ A \neq 0$ (C) $ A = 1$ (D) None of these	
25)	A homogeneous system of three linear equations in three unknowns has a trivial solution if	B
	(A) $ A = 0$ (B) $ A \neq 0$ (C) $ A = 1$ (D) None of these	
26)	A homogeneous system of three linear equations in three unknowns has a infinite number of solution if	A
	(A) $ A = 0$ (B) $ A \neq 0$ (C) $ A = 1$ (D) None of these	
27)	A homogeneous system of three linear equations in three unknowns has a non trivial solution if	A
	(A) $ A = 0$ (B) $ A \neq 0$ (C) $ A = 1$ (D) None of these	
28)	If A is non singular matrix then solution of system of linear equations $AX = B$ is given by	C
	(A) $X = BA^{-1}$ (B) $X = AB$ (C) $X = A^{-1}B$ (D) None of these	
29)	If A is an orthogonal matrix if $ A = \dots\dots$	C
	(A) I (B) 0 (C) ± 1 (D) None of these	
30)	If A is an orthogonal matrix then $A^{-1} = \dots\dots$	B
	(A) A (B) A' (C) I (D) None of these	
31)	The product of two orthogonal matrices is	A
	(A) Orthogonal (B) Not orthogonal (C) Proper orthogonal (D) None of these	

32)	If $A = \begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$ then A is	B
	(A) Improper orthogonal (B) Proper orthogonal (C) Not orthogonal (D) None of these	
33)	If $A = \begin{bmatrix} \cos\theta & \sin\theta \\ \sin\theta & -\cos\theta \end{bmatrix}$ then A is	A
	(A) Improper orthogonal (B) Proper orthogonal (C) Not orthogonal (D) None of these	
34)	Let A be a nonzero square matrix and X be a nonzero (vector) column matrix. If there exist a number λ such that $AX = \lambda X$ then λ is called of the matrix A .	B
	(A) Eigen vector (B) Eigen value (C) Not eigen value (D) None of these	
35)	Let A be a nonzero square matrix and X be a nonzero (vector) column matrix. If there exist a number λ such that $AX = \lambda X$ then X is called of the matrix A .	A
	(A) Eigen vector (B) Eigen value (C) Not eigen value (D) None of these	
36)	Let A be a nonzero square matrix then characteristic polynomial of A is	C
	(A) $ A - \lambda I = 1$ (B) $ A - \lambda I = 0$ (C) $ A - \lambda I $ (D) $(A - \lambda I)$	
37)	Let A be a nonzero square matrix then characteristic Equation of A is	B
	(A) $(A - \lambda I) = 0$ (B) $ A - \lambda I = 0$ (C) $ A - \lambda I $ (D) None of these	
38)	Let A is non zero square matrix k is a non zero scalar. If λ is eigen value of A then eigen value of kA is	A
	(A) $k\lambda$ (B) λ (C) $\frac{k}{\lambda}$ (D) None of these	
39)	If λ is an eigen value of a non singular matrix A then an eigen value of A^m is	B
	(A) λ (B) λ^m (C) 2λ (D) None of these	

40)	If λ is an eigen value of a non singular matrix A then an eigen value of A^{-1} is	B
	(A) λ (B) $\frac{1}{\lambda}$ (C) $-\lambda$ (D) None of these	
41)	If λ is an eigen value of a non singular matrix A then an eigen value of $adjA$ is	A
	(A) $\frac{ A }{\lambda}$ (B) $\lambda A $ (C) $\frac{\lambda}{ A }$ (D) None of these	
42)	If λ is an eigen value of a non singular matrix A then an eigen value of A^2 is	B
	(A) λ (B) λ^2 (C) 2λ (D) None of these	
43)	If $A = \begin{bmatrix} 2 & 2 \\ 1 & 3 \end{bmatrix}$ then the characteristic polynomial of A is	B
	(A) $\lambda^2 - 5\lambda + 8$ (B) $\lambda^2 - 5\lambda + 4$ (C) 2λ (D) None of these	
44)	If origin is shifted to the point (h, k) the direction of axes remains same then translation of point (x, y) is	B
	(A) $(x - h, y - k)$ (B) $(x + h, y + k)$ (C) (x, y) (D) None of these	
45)	The translation of the point (x, y) by h units in the x-direction and k units in y direction is	A
	(A) $(x + h, y + k)$ (B) $(x - h, y - k)$ (C) (x, y) (D) None of these	
46)	The translation of the point $(2, 3)$ by 3 units in the x-direction and 4 units in y direction is	C
	(A) $(-5, 7)$ (B) $(7, 5)$ (C) $(5, 7)$ (D) None of these	
47)	The translation of the point $(3, -2)$ by 4 units in the x-direction and 6 units in y direction is	A
	(A) $(7, 4)$ (B) $(4, 7)$ (C) $(7, 8)$ (D) None of these	

48)	If origin is shifted to the point (h, k) the direction of axes remains same then translation matrix is	A
	(A) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ h & k & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ h & -k & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ -h & -k & 1 \end{bmatrix}$ (D) None of these	
49)	The translation matrix when a point translates by 4 units in the x-direction and 3 units in y direction is	B
	(A) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ -4 & -3 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 4 & 3 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 4 & 0 & 0 \\ 0 & 3 & 0 \\ 1 & 1 & 1 \end{bmatrix}$ (D) None of these	
50)	The rotation matrix when rotate the point (x, y) by angle θ in counter clockwise direction is	B
	(A) $\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$ (B) $\begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ (C) $\begin{bmatrix} \cos\theta & \sin\theta \\ \sin\theta & -\cos\theta \end{bmatrix}$ (D) None of these	
51)	The rotation matrix when rotate the point (x, y) by angle θ in anticlockwise direction is	A
	(A) $\begin{bmatrix} \cos\theta & -\sin\theta \\ \sin\theta & \cos\theta \end{bmatrix}$ (B) $\begin{bmatrix} \cos\theta & \sin\theta \\ -\sin\theta & \cos\theta \end{bmatrix}$ (C) $\begin{bmatrix} \cos\theta & \sin\theta \\ \sin\theta & -\cos\theta \end{bmatrix}$ (D) None of these	
52)	The rotation matrix when rotate the point (x, y) by angle $\frac{\pi}{2}$ in counter clockwise direction is	A
	(A) $\begin{bmatrix} 0 & 1 \\ -1 & 0 \end{bmatrix}$ (B) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ (C) $\begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}$ (D) None of these	
53)	The rotation matrix when rotate the point (x, y) by angle $\frac{\pi}{2}$ in anticlockwise clockwise direction is	A
	(A) $\begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$ (B) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ (C) $\begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}$ (D) None of these	
54)	The rotation matrix when rotate the point (x, y) by angle π in counter clockwise direction is	C
	(A) $\begin{bmatrix} 1 & 0 \\ 0 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} -1 & 0 \\ 0 & -1 \end{bmatrix}$ (D) None of these	

55)	The rotation matrix when rotate the triangle $A(x, y), B(x, y), C(x, y)$ by an angle θ in counter clockwise direction is	A
	(A) $\begin{bmatrix} \cos\theta & \sin\theta & 0 \\ -\sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} \cos\theta & -\sin\theta & 0 \\ \sin\theta & \cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} -\cos\theta & \sin\theta & 0 \\ \sin\theta & -\cos\theta & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (D) None of these	
56)	The rotation matrix when rotate the triangle $A(x, y), B(x, y), C(x, y)$ by an angle $\frac{\pi}{2}$ in counter clockwise direction is	B
	(A) $\begin{bmatrix} 0 & -1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 0 & 1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 0 & -1 & 0 \\ 1 & 0 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (D) None of these	
57)	The reflection matrix when reflect point A about the line $y = x$ is	A
	(A) $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ (B) $\begin{bmatrix} 0 & -1 \\ 1 & 0 \end{bmatrix}$ (C) $\begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}$ (D) None of these	
58)	The reflection matrix when reflect point A about the line $x - axis$ is	B
	(A) $\begin{bmatrix} -1 & 0 \\ 0 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 0 \\ 0 & -1 \end{bmatrix}$ (C) $\begin{bmatrix} 0 & -1 \\ -1 & 0 \end{bmatrix}$ (D) None of these	
60	Choose the correct option .reflecion of the point $P(1,2)$ with respect to X axis is...	A
	(A) $(1, -2)$ (B) $(4, 7)$ (C) $(7, 8)$ (D) None of these	
61	Choose the correct option .reflecion of the point $P(1,2)$ with respect to Y axis is...	A
	(B) $(-1, 2)$ (B) $(4, 7)$ (C) $(7, 8)$ (D) None of these	
62	Choose the correct option .reflecion of the point $P(6,2)$ with respect to X axis is...	A
	(A) $(6, -2)$ (B) $(4, 7)$ (C) $(7, 8)$ (D) None of these	
63	Choose the correct option .reflecion of the point $P(1,12)$ with respect to Y axis is...	A
	(A) $(-1, 12)$ (B) $(4, 7)$ (C) $(7, 8)$ (D) None of these	
64	Meaning of $S_x=S_y > 1$ is ...	B
	(A) Uniform Contraction (B) Uniform Magnification (C) No Change (D) None of these	
65	Meaning of $S_x=S_y < 1$ is ...	A
	(A) Uniform Contraction (B) Uniform Magnification (C) No Change (D) None of these	
66	Meaning of $S_x=S_y = 1$ is ...	A
	(B) Uniform Contraction (B) Uniform Magnification (C) No Change (D) None of these	
67	What will be the transformation matrix if we want to enlarge the entire figure by 3 times	C
	(A) $\begin{bmatrix} 3 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 0 & 1 & 0 \\ -1 & 0 & 0 \\ 0 & 0 & 3 \end{bmatrix}$ (C) $\begin{bmatrix} 3 & 0 & 0 \\ 0 & 3 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (D) None of these	
68	What will be the transformation matrix if we want to enlarge the entire figure by 2 times	C

80	What will be the y shear transformation matrix if y shear parameter a=3 (A) $\begin{bmatrix} 3 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 2 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 1 & 3 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (D) None of these	C
81	What will be the y shear transformation matrix if y shear parameter a=7 (A) $\begin{bmatrix} 3 & 0 & 0 \\ 0 & 4 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (B) $\begin{bmatrix} 1 & 7 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (C) $\begin{bmatrix} 5 & 0 & 0 \\ 0 & 5 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (D) None of these	B
82	If $A = \begin{bmatrix} 6 & 2 \\ 0 & 3 \end{bmatrix}$ then the characteristic polynomial of A is (A) $\lambda^2 - 5\lambda + 8$ (B) $\lambda^2 - 9\lambda + 18$ (C) 2λ (D) None of these	B
83	If $A = \begin{bmatrix} 1 & 2 \\ 0 & 3 \end{bmatrix}$ then the characteristic polynomial of A is (A) $\lambda^2 - 5\lambda + 8$ (B) $\lambda^2 - 4\lambda + 3$ (C) 2λ (D) None of these	B
84	If $A = \begin{bmatrix} 6 & 2 \\ 0 & 3 \end{bmatrix}$ then the characteristic equation of A is (A) $\lambda^2 - 9\lambda + 18 = 0$ (B) $\lambda^2 - 9\lambda + 18$ (C) 2λ (D) None of these	A
85	If $A = \begin{bmatrix} 1 & 2 \\ 0 & 3 \end{bmatrix}$ then the characteristic equation of A is (A) $\lambda^2 - 4\lambda + 3 = 0$ (B) $\lambda^2 - 4\lambda + 3$ (C) 2λ (D) None of these	A
86	If $A = \begin{bmatrix} 6 & 12 \\ 0 & 3 \end{bmatrix}$ then the characteristic equation of A is (A) $\lambda^2 - 9\lambda + 18 = 0$ (B) $\lambda^2 - 9\lambda + 18$ (C) 2λ (D) None of these	A
87	If $A = \begin{bmatrix} 2 & 2 \\ 0 & 4 \end{bmatrix}$ then the characteristic equation of A is (A) $\lambda^2 - 6\lambda + 8 = 0$ (B) $\lambda^2 - 9\lambda + 18$ (C) 2λ (D) None of these	A
88	If $A = \begin{bmatrix} 2 & 6 \\ 0 & 4 \end{bmatrix}$ then the characteristic equation of A is (A) $\lambda^2 - 6\lambda + 18 = 0$ (B) $\lambda^2 - 6\lambda + 8 = 0$ (C) 2λ (D) None of these	B
89	If $A = \begin{bmatrix} 2 & 5 \\ 0 & 4 \end{bmatrix}$ then the characteristic equation of A is (A) $\lambda^2 - 6\lambda + 8 = 0$ (B) $\lambda^2 - 9\lambda + 18$ (C) 2λ (D) None of these	A
90	If $A = \begin{bmatrix} 1 & 2 \\ 0 & 4 \end{bmatrix}$ then the characteristic equation of A is (A) $\lambda^2 - 6\lambda + 8 = 0$ (B) $\lambda^2 - 5\lambda + 4 = 0$ (C) 2λ (D) None of these	B
91	True or False $A^{-1} = \frac{1}{ A } \text{adj } A$ A) True B) False	A
92	True or False The Eigen values of A and A' (i.e. Transpose of A) are equal. A) True B) False	A

93	True or False .Sum of the all eigen Values of square matrix A is its trace (i.e. sum of principal Diagonal elements) A)True B)False	A
94	True or False.Every square matrix satisfies its characteristic equation A)False B)True	B
95	If $A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$ then the characteristic equation of A is (A) $\lambda^2 + 8 = 0$ (B) $\lambda^2 - 5\lambda + 4 = 0$ (C) $\lambda^2 - 4\lambda - 5 = 0$ (D) None of these	C
96	If $A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$ then the characteristic Polynomial of A is (A) $\lambda^2 - 4\lambda - 5$ (B) $\lambda^2 - 5\lambda + 4 = 0$ (C) $\lambda^2 - 4\lambda - 5 = 0$ (D) None of these	A
97	True or False A orthogonal Matrix A is called improper orthogonal if $ A = -1$ A)True B)False	A
98	True or False A orthogonal Matrix A is called improper orthogonal if $ A = 0$ A)True B)False	B
99	True or False $\rho(AB) \geq \min\{\rho(A), \rho(A)\}$ A)True B)False	B
100	True or False $\rho(AB) \geq \max\{\rho(A), \rho(A)\}$ A)True B)False	B