

Model Question Paper
Applications of matrices and determinants - Part I

12th Standard

Business Maths

Reg.No. :

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I. Answer all the questions.
II. Use Blue pen only.

Time : 01:00:00 Hrs

Total Marks : 75

6 x 1 = 6

Section-A

- 1) If the minor of a_{23} equals the cofactor of a_{23} in $|a_{ij}|$ then the minor of a_{23} is
(a) 1 (b) 2 (c) 0 (d) 3
- 2) The Adjoint of $\begin{pmatrix} 0 & 2 \\ 2 & 0 \end{pmatrix}$ is
(a) $\begin{pmatrix} 0 & 2 \\ 2 & 0 \end{pmatrix}$ (b) $\begin{pmatrix} 0 & -2 \\ -2 & 0 \end{pmatrix}$ (c) $\begin{pmatrix} 1 & 0 \\ 0 & 1 \end{pmatrix}$ (d) $\begin{pmatrix} 0 & 2 \\ 2 & 0 \end{pmatrix}$
- 3) The Adjoint of $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ is
(a) $\begin{bmatrix} -1 & 0 & 0 \\ 0 & -1 & 0 \\ 0 & 0 & -1 \end{bmatrix}$ (b) $\begin{bmatrix} \frac{1}{3} & 0 & 0 \\ 0 & \frac{1}{3} & 0 \\ 0 & 0 & \frac{1}{3} \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 0 & 0 \\ 0 & 1 & 0 \\ 0 & 0 & 1 \end{bmatrix}$ (d) $\begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix}$
- 4) If $AB = BA = |A| I$ then the matrix B is
(a) the inverse of A (b) the transpose of A (c) the Adjoint of A (d) 2A
- 5) If A is a square matrix of order 3 then $|\text{Adj}A|$ is
(a) $|A|^2$ (b) $|A|$ (c) $|A|^3$ (d) $|A|^4$
- 6) If $|A| = 0$ then $|\text{Adj}A|$ is
(a) 0 (b) 1 (c) -1 (d) ± 1

Section-B

- 7) Find the Adjoint of the matrix $\begin{pmatrix} -1 & 3 \\ 2 & 1 \end{pmatrix}$
- 8) Find the Adjoint of the matrix $\begin{bmatrix} 2 & 0 & -1 \\ 5 & 1 & 0 \\ 0 & 1 & 3 \end{bmatrix}$
- 9) Show that the Adjoint of the matrix $A = \begin{bmatrix} -4 & -3 & -3 \\ 1 & 0 & 1 \\ 4 & 4 & 3 \end{bmatrix}$ is A itself
- 10) Given $A = \begin{pmatrix} 3 & 1 \\ 4 & 2 \end{pmatrix}$, $B = \begin{pmatrix} -1 & 0 \\ 2 & 1 \end{pmatrix}$ verify that $\text{Adj}(AB) = (\text{Adj} B)(\text{Adj} A)$
- 11) In the second order matrix $A = (a_{ij})$, given that $a_{ij} = i + j$, write out the matrix A and verify that $|\text{Adj} A| = |A|$

Section-C

- 12) If $A = \begin{bmatrix} 1 & 1 & 1 \\ 1 & 2 & -3 \\ 2 & -1 & 3 \end{bmatrix}$, verify that $A(\text{Adj} A) = (\text{Adj} A)A = |A| I$.
- 13) Given $A = \begin{bmatrix} 1 & -1 & 1 \\ 2 & 1 & 1 \\ 3 & 1 & -1 \end{bmatrix}$ verify that $|\text{Adj} A| = |A|^2$
- 14) Solve by matrix method the equations $x - 2y + 3z = 1$, $3x - y + 4z = 3$, $2x + y - 2z = -1$.
- 15) Solve by determinant method the equations $2x + 2y - z - 1 = 0$, $x + y - z = 0$, $3x + 2y - 3z = 1$.

5 x 6 = 30

4 x 10 = 40