SAIMEDHA

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ECET-IES-GATE-PSUs

Max Marks:25 ECET-2024 Time : 1 hrs

Topic: Matrices Date:03-01-2024

1.A square matrix (a_{ij}) in which a_{ij} = 0 for i≠ j and a_{ij} = k (constant) for I = j is
a)Unit matrix b)Scalar matrix c)Null matrix d)Diagonal matrix

2.A_{nxn} and B_{nxn} are diagonal matrices then AB = ……….matrix
a)square b)diagonal c)scalar d)rectangular

3.If A = $[a_{ij}]_{3x3}$ is a square matrix so that $a_{ij} = i^2 – j^2$ then A is a
a) unit matrix b)symmetric matrix c)skew symmetric matrix d)orthogonal matrix

4.If $\begin{bmatrix} x+3 & 2y+x \\ z-1 & 4a-z \end{bmatrix} = \begin{bmatrix} 0 & -7 \\ 3 & 2a \end{bmatrix}$ **, (x+y+z+a) = a)-1 b)0 c)1 d)8**

5. If A = $\begin{bmatrix} 6 & 10 & 100 \\ 7 & 1 & 0 \\ 0 & 9 & 10 \end{bmatrix}$ **then Tr (A^T) =a)-17 b)17 c)-1/17 d)1/17**

6. If A= $\begin{bmatrix} 2 & 0 & 0 \\ 0 & 2 & 0 \\ 0 & 0 & 2 \end{bmatrix}$ **, then A^4 =………… a)16A b)32I c)4A d)8A**

7.If A^2 = A, B^2 = B, AB=BA=0 then $(A+B)^2$ =
a)A-B b)A+B c)$A^2 – B^2$ d)0

8. If A = $\begin{bmatrix} 2 & x-3 & x-2 \\ 3 & -2 & -1 \\ 4 & -1 & -5 \end{bmatrix}$ **is a symmetric matrix then x=**
a)0 b)3 c)6 d)8

9. If A= $\begin{bmatrix} a & b & c \\ b & c & a \\ c & a & b \end{bmatrix}$ **then cofactor of a_{21} is a)b^2 – ac b)ac – b^2 c)a^2 – bcd)bc – a^2**

10. $\begin{vmatrix} x+y+2z & x & y \\ z & y+z+2x & y \\ z & x & z+x+2y \end{vmatrix}$ **=**
a) $(x+y+z)^3$ b)$2(x+y+z)^3$ c)x+y+z d)$(x+y+z)^2$

11. If a,b,c are in A.P., then $\begin{vmatrix} x+1 & x+2 & x+a \\ x+2 & x+3 & x+b \\ x+3 & x+4 & x+c \end{vmatrix}$
a)$\frac{a+b}{2}$ b)ab c)0 d)abc

12. $\begin{vmatrix} a^2+2a & 2a+1 & 1 \\ 2a+1 & a+2 & 1 \\ 3 & 3 & 1 \end{vmatrix}$ **= a)$(1-a)^3$ b)$(a-1)^2$c)$(a-1)^3$ d)$(a+1)^2$**

13. If A is $\begin{bmatrix} 8 & -6 & 2 \\ -6 & 7 & -4 \\ 2 & -4 & \lambda \end{bmatrix}$ **is a singular matrix then λ =a)3 b)4 c)2d)5**

14.If A= $\begin{bmatrix} 0 & 1 & 2 \\ 1 & 2 & 3 \\ 3 & 1 & 1 \end{bmatrix}$ **then Adj (A) =**

a) $\begin{bmatrix} -1 & 8 & -5 \\ 1 & -6 & 3 \\ -1 & 2 & -1 \end{bmatrix}$ **b)** $\begin{bmatrix} -1 & 1 & -1 \\ 8 & -6 & 2 \\ -5 & 3 & -1 \end{bmatrix}$ **c)** $\begin{bmatrix} 1 & -1 & 1 \\ 8 & -6 & 2 \\ -5 & 3 & -1 \end{bmatrix}$ **d)** $\begin{bmatrix} -1 & -8 & 5 \\ -1 & 6 & -3 \\ 1 & -2 & 1 \end{bmatrix}$

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

a) $\begin{bmatrix} 2 & -2 \\ 2 & 3 \end{bmatrix}$ b) $\begin{bmatrix} 3 & -2 \\ 2 & 2 \end{bmatrix}$ c) $\frac{1}{10}\begin{bmatrix} 2 & 2 \\ -2 & 3 \end{bmatrix}$ d) $\frac{1}{10}\begin{bmatrix} 3 & 2 \\ -2 & 2 \end{bmatrix}$

16.The number of solutions of the equations 3x-2y=5, 6x-4y=10 are …

a)0 b)1 c)10 d)infinity

17.$(A+AB)^T = XA^T$ => x= a)B^T b)I+B c)I+B^T d)$B^T.A^T$

18.If A=$\begin{pmatrix} 0 & 0 \\ 1 & 1 \end{pmatrix}$ then the value of $A+A^2+A^3+ - - +A^n$= a)A b)nA c)(n+1)A d)0

19. With usual notations in Δ ABC $\begin{vmatrix} 1 & 1 & 1 \\ sinA & sinB & sinC \\ \sin^2 A & \sin^2 B & \sin^2 C \end{vmatrix}$ =

a) $\frac{1}{8R^3}$ (a-b) (b-c) (c-a) b) $8R^3$ c) (a-b) (b-c) (c-a) d) $\frac{1}{8R}$ (a-b) (b-c) (c-a)

20. The matrix $\begin{bmatrix} 1 & 1 & 1 \\ 1 & 1 & 1 \\ 1 & 1 & 1 \end{bmatrix}$ has

a) one inverse b)two inverse c)no inverse d)cannot be said

21. If A = $\begin{bmatrix} 9 & 0 & 0 \\ 0 & 10 & 0 \\ 0 & 0 & 8 \end{bmatrix}$ then A^{-1}

a) $\begin{bmatrix} \frac{1}{9} & 0 & 0 \\ 0 & 10 & 0 \\ 0 & 0 & \frac{1}{8} \end{bmatrix}$ b) $\begin{bmatrix} 9 & 0 & 0 \\ 0 & \frac{1}{10} & 0 \\ 0 & 0 & 8 \end{bmatrix}$ c) $\begin{bmatrix} 9 & 0 & 0 \\ 0 & 10 & 0 \\ 0 & 0 & \frac{1}{8} \end{bmatrix}$ d) $\begin{bmatrix} \frac{1}{9} & 0 & 0 \\ 0 & \frac{1}{10} & 0 \\ 0 & 0 & \frac{1}{8} \end{bmatrix}$

22.The inverse of $\begin{bmatrix} 2 & 1 & 2 \\ 1 & 0 & 1 \\ 2 & 2 & 1 \end{bmatrix}$ is

a) $\begin{bmatrix} 4 & -3 & -2 \\ -3 & -2 & 2 \\ -2 & 2 & 1 \end{bmatrix}$ b) $\begin{bmatrix} -2 & 3 & 1 \\ -1 & -2 & 0 \\ 2 & -2 & -1 \end{bmatrix}$ c) $\begin{bmatrix} -2 & 3 & 1 \\ 1 & -2 & 0 \\ 2 & -2 & -1 \end{bmatrix}$ d) $\begin{bmatrix} 2 & 3 & 1 \\ 1 & 2 & 0 \\ 2 & 2 & 1 \end{bmatrix}$

23. If A = $\begin{bmatrix} -1 & -2 & -2 \\ 2 & 1 & -2 \\ 2 & -2 & 1 \end{bmatrix}$ then Adj A= a)A^T b)$2A^T$ c)$3A^T$ d)$4A^T$

24. $\begin{vmatrix} z+y & x & x \\ y & z+x & y \\ z & z & x+y \end{vmatrix}$ = a)xyz b)4 xyz c)2 xyz d)3 xyz

25. L = $\begin{bmatrix} 2 & 3 & 5 \\ 4 & 1 & 2 \\ 1 & 2 & 1 \end{bmatrix}$ = P + Q, P is a symmetric matrix, Q is a skew- symmetric matrix then

P= a) $\begin{bmatrix} 2 & 7 & 6 \\ 4 & 1 & 4 \\ 1 & 2 & 1 \end{bmatrix}$ b) $\begin{bmatrix} 2 & -7 & 6 \\ -7 & 1 & 4 \\ 6 & 4 & 1 \end{bmatrix}$ c) $\begin{bmatrix} 2 & 7/2 & 3 \\ 7/2 & 1 & 2 \\ 3 & 2 & 1 \end{bmatrix}$ d) $\begin{bmatrix} 4 & 7 & 6 \\ 7 & 2 & 4 \\ 6 & 4 & 2 \end{bmatrix}$

Key: Matices **Date: 28-12-23**

1–2	**2–2**	**3–3**	**4–3**	**5–2**	**6–4**	**7–2**	**8–3**	**9–2**	**10–2**
11–3	**12–3**	**13–1**	**14–2**	**15–1**	**16–4**	**17–3**	**18–2**	**19–1**	**20–3**
21-4	**22-3**	**23-3**	**24-2**	**25-3**					