

UNIT-2

EIGEN VALUES AND EIGEN VECTORS

Multiple Choice questions

1.	The sum of the eigen values of $\begin{bmatrix} 1 & 0 & 1 \\ 0 & 3 & 0 \\ 1 & 0 & 1 \end{bmatrix}$ is
	(a) 6 (b) 4 (c) 5 (d) 7
2.	The eigen values of $\begin{bmatrix} 0 & 1 \\ 1 & 0 \end{bmatrix}$ are
	(a) i, -i (b) 1, 1 (c) 1, 1 (d) -1, 1
3.	The symmetric matrix associated with the quadratic form $x^2 - 3y^2 + 8xy$ is
	(a) $\begin{bmatrix} 1 & -4 \\ -4 & 3 \end{bmatrix}$ (b) $\begin{bmatrix} 1 & -8 \\ -8 & 3 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 4 \\ 4 & -3 \end{bmatrix}$ (d) $\begin{bmatrix} 1 & 2 \\ 2 & 3 \end{bmatrix}$
4.	The eigen values of A are -3,-3,5 then the nature of the quadratic form $X^T A X$ is
	(a) +ve definite (b) +ve semi definite (c) -ve definite (d) Indefinite
5.	The eigen values of zero matrix of order 3 are
	(a) 0,0,0 (b) 0,1,1 (c) 1,1,1 (d) 0,1,-1
6.	If 1,2,3 are the eigen values of A then the eigen values of A^{-1} are
	(a) 1,2,3 (b) $1, \frac{1}{2}, \frac{1}{3}$ (c) 1,4,9 (d) 1,8,27
7.	By Cayley-hamilton theorem $A = \begin{bmatrix} -3 & 2 \\ -1 & 0 \end{bmatrix}$ satisfies the relation
	(a) $A+3I+2A^2=0$ (b) $A^2+2A+2I=0$ (c) $(A+I)(A+2I)=0$ (d) $\exp(A)=0$
8.	If $\lambda^2 - 5\lambda - 2 = 0$ is the characteristic equation of A then $A^{-1} =$
	(a) $A + 5I$ (b) $A - 5I$ (c) $\frac{A-2I}{2}$ (d) $\frac{A-5I}{2}$
9.	The eigen values of square matrix constitute the
	(a) spectral matrix (b) modal matrix (c) unit matrix (d) none

10	The number of positive terms in canonical form of a Q.F is called__
	(a) Rank (b) Signature (c) Index (d) nature
11	The eigen values of the matrix $\begin{pmatrix} 5 & 4 \\ 1 & 2 \end{pmatrix}$ are_____
	(a) 1,6 (b) 3,4 (c) 2,3 (d) 5, 2
12	A homogeneous expression of second degree is called__
	(a) Quadratic form (b) Canonical form (c) Nature (d) Linear form
13	The eigen values of $A_{3 \times 3}$ are 2,8 and sum is 12 find the 3 rd eigen value is
	(1) b) 0 c) 4 d) 2
14	The eigen values of $\begin{bmatrix} 0 & i \\ i & 0 \end{bmatrix}$ are
	(a) i, -i (b) 1, -1 (c) 1, 1 (d) -1, -1
15	The matrix symmetric matrix associated with the quadratic form $x^2 - y^2 + 2z^2 + 2xy - 2xy - 4yz + 6xz$ is
	(a) $\begin{bmatrix} 1 & 0 & 1 \\ 0 & -1 & -2 \\ 1 & -2 & 2 \end{bmatrix}$ (b) $\begin{bmatrix} 1 & 2 & 2 \\ 2 & -1 & 3 \\ 2 & 3 & 2 \end{bmatrix}$ (c) $\begin{bmatrix} 1 & 1 & 3 \\ 1 & -1 & -2 \\ 3 & -2 & 2 \end{bmatrix}$ d) $\begin{bmatrix} 1 & 3 & 1 \\ 3 & -1 & 2 \\ 1 & 2 & 2 \end{bmatrix}$

Fill in the blanks	
1.	The latent roots of $\begin{bmatrix} a & h & g \\ 0 & b & 0 \\ 0 & 0 & c \end{bmatrix}$ are _____
2	A matrix A is diagonalizable if $P^{-1}AP =$ _____
3	Symmetric matrix of the quadratic form $x^2 + y^2 + z^2 - 2xy$ is _____
4	If the Eigen values of A are -1,2,0 then $ A =$ _____
5	The matrix realting to the quadratic form $x_1^2 + 6x_1x_2 + 5x_2^2$ _____
6	Eigen values are $\lambda = 1,2,0$, find signature _____
7	All eigen values are positive then nature of the quadratic form _____
8	Eigen values are $\lambda = 2, -2, 1$, find , rank of Q.F _____
9	The quadratic form corresponding to the matrix $A = \begin{bmatrix} 1 & 0 & 2 \\ 0 & 1 & 3 \\ 2 & 3 & 2 \end{bmatrix}$ is _____
10	Cayley-Hamilton theorem states that _____
11	The eigen values of the matrix $\begin{bmatrix} 1 & 1 \\ 0 & 2 \end{bmatrix}$ are _____
12	If $A = \begin{bmatrix} 1 & 4 \\ 2 & 3 \end{bmatrix}$ then the modal matrix is _____
13	Characteristic equation of $A = \begin{bmatrix} 1 & -2 & -8 \\ 0 & 2 & 1 \\ 0 & 0 & 3 \end{bmatrix}$ _____
14	The index and the signature of the form $2x^2 + 2y^2 + 2xy + 2z^2$
15	If $D = P^{-1}AP$ then $A^2 =$