

Name of College - S.S. College

Dept - Mathematics

Topic - Objective questions on Matrix

Class - B.Sc (Sub)

Time - 1.00 P.M to 1.45 P.M

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Objective question

1. Choose only one correct option

(1) If A is Symmetric as well as Skew Symmetric Matrix then A is

- (a) Hermitian Matrix (b) Null Matrix
(c) Triangular Matrix (d) None of these.

(2) If $A = \begin{bmatrix} 3 & 1 & -1 \\ 0 & 1 & 2 \end{bmatrix}$ then AA^T is a/a

- (a) Symmetric Matrix (b) Skew Symmetric Matrix
(c) Conjugate Matrix (d) None of these.

④ If A is a $n \times n$ square matrix, then Trace of A is equal to

- (a) 1 (b) n (c) $|A|$ (d) None of these

⑨ If A is skew-symmetric matrix and n is an odd +ve integer, then A^n is

- (a) Symmetric matrix (b) Skew Symmetric matrix
(c) Transjugate matrix (d) None of these

⑤ If $A = [a_{ij}]_{n \times n}$ be a diagonal matrix with diagonal element all different and $B = [b_{ij}]_{n \times n}$ be another matrix.

Let $AB = [c_{ij}]_{n \times n}$ then c_{ij} is equal to

- (a) $a_{jj} b_{ij}$ (b) $a_{ji} b_{ij}$
(c) $a_{ij} b_{ij}$ (d) $a_{ij} b_{ji}$

✓ $[a_{ij}]_{n \times n}$ be a Matrix where
 $a_{ij} = \sin(\theta_i - \theta_j) + i \cos(\theta_i - \theta_j)$
 then M is equal to

- (a) $\bar{M}$ (b) $-\bar{M}$
 (c) $(\bar{M})^T$ (d) $-(\bar{M})^T$

(7) A square Matrix M satisfies
 $M^2 = I - M$ where I is the
 identity Matrix. If $M^n = 5I - 8M$ then
 n is equal to

- (a) 4 (b) 5
 (c) 6 (d) 7

(8) If a skew Symmetric Matrix of order 3
 then the Matrix A^3 is
 (a) Skew Symmetric Matrix (b) Symmetric Matrix
 (c) Diagonal Matrix (d) None of these

(9) If for all x , $\text{Trace}(Ax) = 0$, then A is
 (a) Null Matrix (b) Hermitian Matrix
 (c) Tri-diagonal Matrix (d) Symmetric Matrix

(a) If A is skew-Hermitian,
then $\frac{1}{i}A$ is Hermitian

(b) Every Hermitian is real symmetric
Matrix

(c) Every skew-Hermitian is real
symmetric Matrix

(d) for any square Matrix A
 $A + A^T$ is skew symmetric
Matrix

Fill in the Blank

(11) $A + A^T$ is - - -

(12) $A - A^*$ is - - -

(13) $A + A^*$ is - - -

(14) $A - A^T$ is - - -

(15) AA^T is - - -

(16) AA^* is - - -

(17) If $A = \begin{bmatrix} 1 & 2 & 3 \\ 2 & 3 & 4 \\ 3 & 4 & 5 \end{bmatrix}$ then $2A^T - A = - - -$

(18) Mark each of the following true (X) or false (F).
If A is Hermitian then each diagonal element is real.

(19) If A is Skew Hermitian then each diagonal element of A is zero or purely imaginary.

(20) If A is Skew Symmetric then each diagonal element of A is zero.

(21) For any Square Matrix A ,
Trace of A^2 is purely imaginary