

Section-A

1. Select the correct Answer:

- (i) If  $z_1$  and  $z_2$  are any two complex numbers, then:  
 (a)  $|z_1 + z_2| < |z_1| + |z_2|$  (b)  $|z_1 + z_2| \leq |z_1| + |z_2|$   
 (c)  $|z_1 - z_2| < |z_1| - |z_2|$  (d)  $|z_1 + z_2| \geq |z_1| + |z_2|$
- (ii) If  $z = 3i - 4$ , then  $z + \bar{z} =$  \_\_\_\_\_  
 (a) 8 (b)  $-3i$  (c)  $-8$  (d)  $(3i - 8)$
- (iii) If  $a > 0$  and  $b < 0$ , then \_\_\_\_\_  
 (a)  $ab > 0$  (b)  $ab < 0$  (c)  $ab = 0$  (d) all of them
- (iv) If a matrix A has m row and n column, then order of A is:  
 (a)  $m \times n$  (b)  $n \times m$  (c)  $mn$  (d)  $m^n$
- (v) Any matrix of order  $m \times 1$  is called:  
 (a) Row matrix (b) Column matrix  
 (c) square matrix (d) zero matrix
- (vi) A square matrix A is skew symmetric if:  
 (a)  $A^t = A$  (b)  $A^t = -A$  (c)  $(A^t)^t = A$  (d) None
- (vii) A square matrix A is Hermitian matrix if:  
 (a)  $A^t = A$  (b)  $A^t = -A$  (c)  $(A^t)^t = A$  (d)  $(A^t)^t = -A$
- (viii) Each diagonal element of main diagonal of a skew Hermitian matrix must be:  
 (a) 1 (b) 0 (c) Any non-zero number (d) Any complex number
- (ix) If  $\begin{vmatrix} a & b \\ 0 & 7 \end{vmatrix} = \begin{vmatrix} 2 & 3 \\ 0 & -9 \end{vmatrix}$  then \_\_\_\_\_  
 (a)  $a = -3$  (b)  $a = b$  (c)  $a = \frac{1}{3}$  (d)  $a = -31$
- (x) The magnitude of  $\vec{a} \times \vec{b}$  represents the \_\_\_\_\_ of a parallelogram with adjacent sides  $\vec{a}$  and  $\vec{b}$ .  
 (a) Opposite sides volume (b) diagonal (c) area (d)
- (xi) The volume of tetrahedron determined by vectors  $\vec{a}$ ,  $\vec{b}$  and  $\vec{c}$  is:  
 (a)  $[\vec{a}, \vec{b}, \vec{c}]$  (b)  $\frac{1}{3}[\vec{a}, \vec{b}, \vec{c}]$  (c)  $\frac{1}{6}[\vec{a}, \vec{b}, \vec{c}]$  (d) None
- (xii)  $\vec{a} \cdot (\vec{b} \times \vec{c}) =$  \_\_\_\_\_  
 (a)  $\vec{a} \cdot \vec{b} \cdot \vec{c}$  (b)  $\vec{a} \times \vec{b} \cdot \vec{c}$  (c)  $\vec{b} \cdot (\vec{a} \times \vec{c})$  (d)  $(\vec{a} \times \vec{b}) \cdot \vec{c}$
- (xiii) If  $a_n - a_{n-1} = n + 1$  and  $a_4 = 14$  then  $a_5 =$   
 (a) 3 (b) 5 (c) 14 (d) 20
- (xiv) A sequence  $\{a_n\}$  in which  $a_{n+1} - a_n$  is the same number for all  $n \in \mathbb{N}$  is called:  
 (a) A.P (b) G.P (c) H.P (d) None of these
- (xv) If  $a_{n-1}, a_n, a_{n+1}$  are in A.P, then  $a_n$  is called.:  
 (a) A.M (b) G.M (c) H.M (d) Mid-point
- (xvi)  $\tan^{-1}(-x) =$  \_\_\_\_\_  
 (a)  $-\tan^{-1} x$  (b)  $\pi - \tan^{-1} x$  (c)  $\cot^{-1} x$  (d)  $\tan^{-1} x$
- (xvii)  $\tan^{-1}(-1) =$  \_\_\_\_\_  
 (a)  $\frac{\pi}{4}$  (b)  $-\frac{\pi}{4}$  (c)  $\frac{\pi}{2}$  (d)  $\frac{\pi}{2}$
- (xviii) The product of two conjugate complex number is:  
 (a) A real number (b) An imaginary number  
 (c) Always zero (d) Not defined