

**VITEEE - 2018 - SAMPLE QUESTIONS**

**MATHEMATICS**

1. If  $A$  is a non-singular matrix and  $(A - 2I)(A - 4I) = [0]$ , then  $\frac{1}{6}A + \frac{4}{3}A^{-1}$  is  
A)  $[0]$       B)  $I$       C)  $2I$       D)  $6I$
2. The amplitude of the complex number  $Z = \frac{-1+i\sqrt{3}}{2}$  is  
A)  $\frac{\pi}{6}$       B)  $\frac{\pi}{3}$       C)  $\frac{2\pi}{3}$       D)  $\frac{4\pi}{3}$
3. The eccentricity of ellipse  $4x^2 + 9y^2 - 16x = 20$  is  
A)  $\frac{\sqrt{5}}{3}$       B)  $\frac{2}{3}$       C)  $\frac{1}{3}$       D)  $\frac{4}{3}$
4. If  $\bar{a}$  and  $\bar{b}$  are unit vectors and  $\theta$  is the angle between  $\bar{a}$  and  $\bar{b}$  then  $\sin \frac{\theta}{2}$  is equal to  
A) 1      B)  $\frac{1}{2}|\bar{a} - \bar{b}|$       C) 0      D)  $\frac{1}{2}|\bar{a} + \bar{b}|$
5. The image of the point  $(1, 2, 4)$  in the plane  $2x - y + z + 2 = 0$  is  
A)  $(-3, 4, 2)$       B)  $(3, -4, 2)$       C)  $(-3, -4, 2)$       D)  $(-3, 4, -2)$
6.  $\lim_{x \rightarrow 0} [1 + x \sin(\pi - x)]^{\frac{1}{x}}$  is equal to  
A) 0      B) e      C) 1      D)  $\pi$
7.  $\int_0^{\pi} \log(\sin^2 x) dx =$   
A)  $2\pi \log_e\left(\frac{1}{2}\right)$       B)  $2\pi \log_e(2)$       C)  $\pi \log_e\left(\frac{1}{2}\right)$       D)  $\pi \log_e(2)$
8. The general solution of the differential equation  $2x + \frac{dy}{dx} - y = 3$  is  
A)  $y = 2x - 1$       B)  $x^2 + y^2 = 2x - 1$       C)  $y = C_1 e^x + 2x - 1$       D)  $y^2 = C_1 e^x + 2x - 1$
9. A die is thrown 100 times. Getting an even number is considered as a success, the variance of number of successes is  
A) 50      B) 25      C) 10      D) 100
10. In the set of integers under the operation  $a \times b = a + b - ab$ , the identity element is  
A) 0      B) 1      C) a      D) b