VITEEE Sample Questions

Note: Please select the most appropriate choice from A, B, C and D. No negative marking

MATHEMATICS

1. For the system of equations $x + ky + z = 0,\ kx + 3y - kz = 0,\ x - y - 3z = 0$ to have only the trivial solution, *k* cannot be equal to

   A) 2 and 3 B) −2 and 3 C) 2 and −3 D) −2 and −3

2. How many positive numbers $\boldsymbol{x}$ satisfy the equation cos (97 $\boldsymbol{x}$) = $\boldsymbol{x}$?

   A) 1 B) 15 C) 31 D) 49

3. The locus of the mid-point of the focal chord of the parabola $y^2 = 4x$ is a parabola, whose vertex is

   A) $(0, 0)$ B) $(1, 0)$ C) $(0, 1)$ D) $(1, 1)$

4. If two forces of magnitude 7 and 50 units act in the directions $3\hat{\imath} + 2\hat{\jmath} - 6\hat{k}$ and $9\hat{\imath} - 12\hat{\jmath} + 20\hat{k}$ respectively on a particle moving it from the point *A* (1, 0, -3) to the point *B* (3, -2, -5), then the work done by the forces is

   A) 14 units B) 27 units C) 18 units D) 24 units

5. One end-point of a diameter of the sphere $x^2 + y^2 + z^2 - x - 2z = 1$ is (1, 1, 0). Then the other end-point of the diameter will be

   A) (0, 1, 0) B) (1, 1, 2) C) $(1, \sqrt{2}, 1)$ D) (0, −1, 2)

6. $\lim_{x \to 0} (\cos x)^{1/x^2}$ is equal to

   A) e^{-1} B) 1 C) e D) $e^{-1/2}$

7. The bounded area cut-off by the line $y - x + 4 = 0$ from the parabola $y^2 = 2x$ is equal to

   A) $\frac{8}{3}$ B) $\frac{14}{3}$ C) $\frac{40}{3}$ D) 18

8. The general solution of the differential equation

   $[\cos x \tan y + 2\cos(x + y)]\, dx + [\sin x \sec^2 y + 2\cos(x + y)]\, dy = 0$ is

   A) $\cos x \tan y - 2\cos(x + y) = C$ B) $\cos x \tan y + 2\cos(x + y) = C$

   C) $\sin x \tan y - 2\sin(x + y) = C$ D) $\sin x \tan y + 2\sin(x + y) = C$

9. A pair of coins is tossed a fixed number of times. If the probability of getting both heads exactly 3 times is same as the probability of getting both heads exactly 4 times, then the number of trials is

   A) 7 B) 15 C) 21 D) 14

10. Consider the following statements

    p : suman is brilliant

    q : suman is rich

    r : suman is honest

    The negation of the statement "suman is brilliant and dishonest if and only if suman is rich" is equivalent to

    A) $(p \to r) \leftrightarrow q$ B) $(r \to p) \leftrightarrow q$ C) $p \to (r \leftrightarrow q)$ D) $r \to (p \leftrightarrow q)$