

VITEEE-2020 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 x satisfy the equation $\cos(97x) = x$?
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 $3\hat{i} + 2\hat{j} - 6\hat{k}$ and $9\hat{i} - 12\hat{j} + 20\hat{k}$ 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. $\lim_{x \rightarrow 0} (\cos x)^{1/x^2}$ 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) $(p \rightarrow r) \leftrightarrow q$ B) $(r \rightarrow p) \leftrightarrow q$ C) $p \rightarrow (r \leftrightarrow q)$ D) $r \rightarrow (p \leftrightarrow q)$