04/09/2020-Shift 1

EE24BTECH11021 - Eshan Ray

16) The mean and variance of 8 observations are 10 and 13.5, respectively. If 6 of these observations are $5, 7, 10, 12, 14, 15$, then the absolute difference of the remaining two observations is:
   a) 3
   b) 9
   c) 7
   d) 5

17) A survey shows that 63% of the people in a city read newspaper A whereas 76% read newspaper B. If $x\%$ of the people read both the newspapers, then a possible value of x can be:
   a) 37
   b) 29
   c) 65
   d) 55

18) Given the following two statements:
   (S_1) : $(q \vee p) \rightarrow (p \leftrightarrow \sim q)$ is a tautology
   (S_2) : $\sim q \wedge (\sim p \leftrightarrow q)$ is a fallacy. Then:
   a) only (S_1) is correct.
   b) both (S_1) and (S_2) are correct.
   c) only (S_2) is correct.
   d) both (S_1) and (S_2) are not correct.

19) Two vertical poles $AB = 15m$ and $CD = 10m$ are standing apart on a horizontal ground with points A and C on the ground. If P is the point of intersection of BC and AD, then the height of P (inm) above the line AC is:
   a) 5
   b) $\frac{20}{3}$
   c) $\frac{10}{3}$
   d) 6

20) If $\left(a + \sqrt{2}b\cos x\right)\left(a - \sqrt{2}b\cos y\right) = a^2 - b^2$, where $a>b>0$, then $\frac{dx}{dy}$ at $\left(\frac{\pi}{4}, \frac{\pi}{4}\right)$ is:
   a) $\frac{a+b}{a-b}$
   b) $\frac{a-2b}{a+2b}$
   c) $\frac{a-b}{a+b}$
   d) $\frac{2a+b}{2a-b}$

21) Suppose a differentiable function $f(x)$ satisfies the identity $f(x+y) = f(x) + f(y) + xy^2 + x^2y$,for all real x and y.If $\lim_{x\to 0} \frac{f(x)}{x} = 1$, then $f\prime(3)$ is equal to...

22) If the equation of a plane P, passing through the intersection of the planes, $x + 4y - z + 7 = 0$ and $3x + y + 5z = 8$ is $ax + by + 6z = 15$ for some $a, b \in R$, then the distance

of the point $(3, 2, -1)$ from the plane P is... units

23) If the system of equations
$x - 2y + 3z = 9$
$2x + y + z = b$
$x - 7y + az = 24$, has infinitely many solutions, then $a - b$ is equal to ...

24) Let $\left(2x^2 + 3x + 4\right)^{10} = \sum_{r=0}^{20} a_r x^r$. Then $\frac{a_7}{a_{13}}$ is equal to...

25) The probability of a man hitting a target is $\frac{1}{10}$.The least number of shots required, so that the probability of his hitting the target at least once is greater than $\frac{1}{4}$, is...