# 02-09-2020 shift-1-16-25

EE24BTECH11060 - Sruthi Bijili

16) Let $\alpha > 0, \beta > 0$ be such that $\alpha^3 + \beta^3 = 4$.If the maximum value of the term independent of $x$ in the binomial expansion of $\left(\alpha x^{\frac{1}{9}} + \beta x^{\frac{-1}{6}}\right)$ is $10k$,then $k$ equals to:
   a) 176
   b) 336
   c) 352
   d) 84

17) Let $S$ be the set of all $\lambda \in R$ for which the system of linear equations
   $2x - y + 2z = 2$
   $x - 2y + \lambda z = -4$
   $x + \lambda y + z = 4$ has no solution. Then the set $S$
   a) is an empty set
   b) is a singleton
   c) contains more than two elements.
   d) contains exactly two elements.

18) Let $X = \{x \in N : 1 \le x \le 17\}$ and $Y = \{ax + b : x \in X and a, b \in R, a > 0\}$.If mean and variance of elements of $Y$ are 17 and 216 respectively then $a + b$ is equal to:
   a) 27
   b) 7
   c) $-7$
   d) 9

19) Let $y = y(x)$ be the solution of the differential equation, $\frac{2+\sin x}{(y+1)\left(\frac{dy}{dx}\right)} = -\cos x$, $y > 0, y(0) = 1$.If $y(\pi) = a$,and $\left(\frac{dy}{dx}\right)$at $x = \pi$ is $b$, then the ordered pair $(a, b)$ is equal to:
   a) $\left(2, \frac{2}{3}\right)$
   b) $(1, 1)$
   c) $(2, 1)$
   d) $(1, -1)$

20) The plane passing through the points $(1, 2, 1)$, $(2, 1, 2)$ and parallel to the line, $2x = 3y$, $z = 1$ also passes through the point:
   a) $(0, -6, 2)$
   b) $(0, 6, -2)$
   c) $(-2, 0, 1)$
   d) $(2, 0, -1)$

21) The number of integral values of $k$ for which the line, $3x + 4y = k$ intersects the circle, $x^2 + y^2 - 2x - 4y + 4 = 0$ at two distinct points is

22) Let $\mathbf{a}, \mathbf{b}$ and $\mathbf{c}$ be three unit vectors such that $|a - b|^2 + |a - c|^2 = 8$.Then $|a + 2b|^2 + |a + 2c|^2$ is equal to:

23) If the letters of the word MOTHER be permuted and all the words so formed be listed as in a dictionary, then the position of the word MOTHER is …

24) If $\lim_{x\to 1} \frac{x+x^2+x^3+\ldots x^n-n}{x-1}=820$ $n \in N$, then the value of $n$ is equal to:

25) The integral $\int_0^2 ||x-1|-x|\,dx$ is equal to: