03/09/2020-Shift 1

EE24BTECH11021 - Eshan Ray

16) If the number of integral terms in the expansion of $\left(3^{\frac{1}{2}} + 5^{\frac{1}{8}}\right)^{n}$ is exactly 33, then the least value of n is :   [Sep-2020]
   a) 264
   b) 256
   c) 128
   d) 248

17) If α and β are the roots of the equation $x^2 + px + 2 = 0$ and $\frac{1}{\alpha}$ and $\frac{1}{\beta}$ are the roots of the equation $2x^2 + 2qx + 1 = 0$, then $\left(\alpha - \frac{1}{\alpha}\right)\left(\beta - \frac{1}{\beta}\right)\left(\alpha + \frac{1}{\beta}\right)\left(\beta + \frac{1}{\alpha}\right)$ is equal to: [Sep-2020]
   a) $\frac{9}{4}\left(9 + p^2\right)$
   b) $\frac{9}{4}\left(9 + q^2\right)$
   c) $\frac{9}{4}\left(9 - p^2\right)$
   d) $\frac{9}{4}\left(9 - q^2\right)$

18) Let $[t]$ denote the greatest integer $\leq t$. If for some $\lambda \in R - \{0, 1\}$, $\lim_{x \to 0} \left|\frac{1 - x + |x|}{\lambda - x + [x]}\right| = L$, then L is equal to: [Sep-2020]
   a) 0
   b) 2
   c) $\frac{1}{2}$
   d) 1

19) $2\pi - \left(\sin^{-1}\frac{4}{5} + \sin^{-1}\frac{5}{13} + \sin^{-1}\frac{16}{65}\right)$ is equal to :   [Sep-2020]
   a) $\frac{7\pi}{4}$
   b) $\frac{5\pi}{4}$
   c) $\frac{3\pi}{2}$
   d) $\frac{\pi}{2}$

20) The proposition $p \to\sim (p\wedge \sim q)$ is equivalent to :   [Sep-2020]
   a) $(\sim p) \vee q$
   b) q
   c) $(\sim p) \wedge q$
   d) $(\sim p) \vee (\sim q)$

21) If $\lim_{x \to 0}\left\{\frac{1}{x^8}\left(1 - \cos\frac{x^2}{2} - \cos\frac{x^2}{4} + \cos\frac{x^2}{2}\cos\frac{x^2}{4}\right)\right\} = 2^{-k}$, then the value of k is ... [Sep-2020]

22) The diameter of the circle, whose centre lies on the line $x+y = 2$ in the first quadrant and which touches both the lines $x = 3$ and $y = 2$, is... [Sep-2020]

23) The value of $(0.16)^{\log_{2.5}\left(\frac{1}{3} + \frac{1}{3^2} + \frac{1}{3^3}...to\infty\right)}$ is equal to ... [Sep-2020]

24) Let $A = \begin{pmatrix} x & 1 \\ 1 & 0 \end{pmatrix}$, $x \in R$ and $A^4 = \left[a_{ij}\right]$. If $a_{11} = 109$, then a_{22} is equal to ... [Sep-2020]

25) If $\left(\frac{1+i}{1-i}\right)^{m/2} = \left(\frac{1+i}{i-1}\right)^{n/3} = 1, (m, n \in N)$ then the greatest common divisor of the least values of m and n is ...   [Sep-2020]