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EE24BTECH11038 - MALAKALA BALA SUBRAHMANYA ARAVIND

21) Consider a triangle having vertices $\mathbf{A}(-2, 3)$, $\mathbf{B}(1, 9)$, $\mathbf{C}(3, 8)$. if a line L passing through the circumcentre of triangle ABC, bisects the line BC, and intersects the Y-axis at $\left(0, \frac{\alpha}{2}\right)$, then the value of real number α is

22) Let $\{a_n\}_{n=1}^{\infty}$ be a sequence such that $a_1 = 1, a_2 = 1$ and $a_{n+2} = 2a_{n+1} + 1$ for all $n \geq 1$. Then the value of $47 \sum_{n=1}^{\infty} \frac{a_n}{2^{3n}}$

23) The number of solutions of the equations $\log_{(x+1)}^{(2x^2+7x+5)} + \log_{(2x+5)}^{(x+1)^2} - 4 = 0$, $x > 0$, is

24) If $\lim_{x \to 0} \frac{\alpha x e^x - \beta \log_e^{1+x} + \gamma x^2 e^{-x}}{x \sin^2 x} = 10$,α, β, $\gamma \in \mathbf{R}$, then the value of $\alpha + \beta + \gamma$ is

25) For $p > 0$, a vector $\mathbf{v}_2 = 2\hat{i} + (p+1)\hat{j}$ is obtained by rotating the vector $\mathbf{v}_1 = \sqrt{3}p\hat{i} + \hat{j}$ by an angle θ about the origin in a counter clock wise direction if $\tan \theta = \frac{\alpha \sqrt{3} - 2}{4\sqrt{3} + 3}$, then the value of α is