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EE24BTECH11038 - MALAKALA BALA SUBRAHMANYA ARAVIND

16) Let $p_1, p_2, p_3, \cdots, p_{15}$ be points on circle. The number of distinct triangles formed by points p_i, p_j, p_k such that i+j+k≠15, is :

a) 12
b) 419
c) 443
d) 455

17) The range of the function,

$$f(x) = \log_{\sqrt{5}}\left(3 + \cos\left(\frac{3\pi}{4} + x\right) + \cos\left(\frac{\pi}{4} + x\right) + \cos\left(\frac{\pi}{4} - x\right) - \cos\left(\frac{3\pi}{4} - x\right)\right)$$

is:

a) $\left(0, \sqrt{5}\right)$

b) $[-2, 2]$

c) $\left[\frac{1}{\sqrt{5}}, \sqrt{5}\right]$

d) $[0, 2]$

18) Let $a_1, a_2, a_3, \cdots, a_{21}$ be an A.P such that $\sum_{n=1}^{20} \frac{1}{a_n a_{n+1}} = \frac{4}{9}$. If the sum of this A.P is 189, then $a_6 a_{16}$ is equal to :

a) 57
b) 72
c) 48
d) 36

19) The function f(x), that satisfies the condition f(x)=x+$\int_0^{\frac{\pi}{2}} \sin x . \cos y f(y)\, dy$, is :

a) x+$\frac{2}{3}(\pi - 2)\sin x$
b) x+$(\pi + 2)\sin x$
c) x+$\frac{\pi}{2}\sin x$
d) x+$(\pi - 2)\sin x$

20) Let θ be the acute angle between the tangents to the ellipse $\frac{x^2}{9} + \frac{y^2}{1}$=1 and the circle $x^2 + y^2 = 3$ at their point of intersection in the first quadrant then $\tan\theta$ is equal to:

a) $\frac{5}{2\sqrt{3}}$
b) $\frac{2}{\sqrt{3}}$
c) $\frac{4}{\sqrt{3}}$
d) 2