jee-main-maths-31-01-2024-shift-2

EE24BTECH11030 - J.KEDARANANDA

1) The number of ways in which 21 identical apples can be distributed among three

2) Let A (a, b), B(3, 4) and (-6, -8) respectively denote the centroid, circumcentre and orthocentre of a triangle. Then, the distance of the point P(2a + 3, 7b + 5) from the

3) Let z_1 and z_2 be two complex number such that $z_1 + z_2 = 5$ and $z_1^3 + z_2^3 = 20 + 15i$.

line 2x + 3y - 4 = 0 measured parallel to the line x - 2y - 1 = 0 is

b) $\frac{17\sqrt{5}}{6}$

c) 142

c) $\frac{17\sqrt{5}}{7}$ d) $\frac{\sqrt{5}}{17}$

d) 136

children such that each child gets at least 2 apples, is

b) 130

a) 406

a) $\frac{15\sqrt{5}}{7}$

Then $|z_1^4 + z_2^4|$ equal-

a) $30\sqrt{3}$	b) 75	c) $15\sqrt{15}$	d) $25\sqrt{3}$		
4) Let a variable line passing through the centre of the circle $x^2 + y^2 - 16x - 4y = 0$, meet the positive co-ordinate axes at the point A and B. Then the minimum value of OA + OB, where O is the origin, is equal to					
a) 12	b) 18	c) 20	d) 24		
5) Let f,g :(0,\infty) be two functions defined by $f(x) = \int_{-x}^{x} (t - t^2)e^{-t^2}dt$ and $g(x) = \int_{0}^{x^2} t^{\frac{1}{2}}e^{-t}dt$. Then the value of $(f(\sqrt{\ln 9}) + g(\sqrt{\ln 9}))$ is equal to					
a) 6	b) 9	c) 8	d) 10		
6) Let (α, β, γ) be mirror image of the point (2, 3, 5) in the line $\frac{x-1}{2} - \frac{y-2}{3} - \frac{z-3}{4}$. Then $2\alpha + 3\beta + 4\gamma$ is equal to					
a) 32	b) 33	c) 31	d) 34		
7) Let P be a parabola with vertex (2, 3) and directrix $2x + y = 6$. Let an ellipse E: $\frac{x^2}{a^2} + \frac{y^2}{b^2} = 1$, $a > b$ of eccentricity $\frac{1}{\sqrt{2}}$ pass through the focus of the parabola P. Then the square of the length of the latus rectum of E, is					

;	a) 970	b) 916	c) 980	d) 990		
10) Let $f: \to \mathbb{R} \to (0,\infty)$ be strictly increasing function such that $\lim_{x\to\infty} \frac{f(7x)}{f(x)}$. Then, the value of $\lim_{x\to\infty} \left[\frac{f(5x)}{f(x)} - 1\right]$ is equal to						
;	a) 4	b) 0	c) $\frac{7}{5}$	d) 1		
11) The area of the region enclosed by the parabolas $y = 4 - x^2$ and $3y = (x - 4)^2$ is in (sq. unit)?						
;	a) $\frac{14}{3}$	b) 4	c) $\frac{32}{3}$	d) 6		
12) Let the mean and the variance of 6 observation a, b, 68, 44, 48, 60 be 55 and 194, respectively if a > b, then a + 3b is						
;	a) 200	b) 190	c) 180	d) 210		
13) If the function $f: (-\infty, -1] \to (a, b]$ defined by $f(x) = e^{x^3 - 3x + 1}$ is one-one and onto, then the distance of the point $\mathbf{P}(2b + 4, a + 2)$ from the line $x + e^{-3}y = 4$ is:						
;	a) 18	b) 20	c) 24	d) 32		
14) Consider the function $f:(0,\infty)\to R$ defined by $f(x)=e^{- \ln x }$. If m and n be respectively the number of points at which f is not continuous and f is not differentiable, then m + n is						

b) $\frac{347}{8}$ c) $\frac{512}{25}$ d) $\frac{656}{25}$

8) The temperature T(t) of a body at time t = 0 is $160 \,^{\circ}$ F and it decreases continuously as per the differential equation $\frac{dT}{dt} = -K(T-80)$, where K is positive constant. If

9) If 2nd, 8th, 44th terms of A.P. are 1st, 2nd and 3rd terms respectively of G.P. and first

term of A.P. is 1 then the sum of first 20 terms of A.P. is

a) $\frac{385}{8}$

a) 85 °Fb) 95 °Fc) 90 °Fd) 80 °F

 $T(15) = 120 \,^{\circ}F$, then T(45) is

a) 0

b) 3

- c) 1
- d) 2
- 15) The number of solutions, of the equation $e^{\sin x} 2e^{-\sin x} = 2$ is
 - a) 2

- b) more than 2
- c) 1

d) 0