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EE24BTECH11060 - Sruthi Bijili

16) Let three real numbers a, b, c be in arithmetic progression and $a+1$,b,$c+3$ are in geometric progression.If a>10 and the arithmetic mean of a, b, c is 8 ,then the cube of geometric mean of a, b and c is
    a) 120
    b) 128
    c) 312
    d) 316
17) The value of $\frac{1\times2^2+2\times3^2+\cdots+100\times(101)^2}{1^2\times2+2^2\times3+\cdots+100^2\times101}$ is
    a) $\frac{306}{305}$
    b) $\frac{305}{301}$
    c) $\frac{31}{30}$
    d) $\frac{32}{31}$
18) If the coefficients of x^4,x^5 and x^6 in the expansion of $(1+x)^n$ are in the arithmetic progression,then the maximum value of n is:
    a) 28
    b) 14
    c) 21
    d) 7
19) The area $(insq.units)$ of the region described by $\left\{(x, y) : y^2 \leq 2x, andy \geq 4x-1\right\}$ is
    a) $\frac{8}{9}$
    b) $\frac{9}{32}$
    c) $\frac{11}{32}$
    d) $\frac{11}{12}$
20) If the function $f(x)$=$\begin{cases} \frac{72^x-9^x-8^x+1}{\sqrt{2}-\sqrt{1+\cos x}}, x \neq 0 \\ a\log_e 2\log_e 3, x=0 \end{cases}$ is continuous at x=0, then the value of a^2 is equal to
    a) 746
    b) 968
    c) 1250
    d) 1152
21) Let y=$y(x)$ be the solution of differeential equation $(x+y+2)^2\,dx = dy$,$y(0)$=-2.Let the maximum and minimum values of the function y=$y(x)$ in $\left[0, \frac{\pi}{3}\right]$ be α and β,respectively.If $(3\alpha+\pi)^2+\beta^2$=$\gamma+\delta\sqrt{3}$,$\gamma, \delta \in Z$,then $\gamma+\delta$ equals
22) In the tournament, a team plays 10 matches with probabilities of winning and losing each match is $\frac{1}{3}$ and $\frac{2}{3}$ respectively.Let x be the number of matches that the team

wins,and y be the number of matches that team loses.If the probability $P|x-y| \leq 2$ is p,then 3^9p equals

23) Consider the line L passing through the points $P(1,2,1)$ and $Q(2,1,-1)$.If the mirror image of the point $A(2,2,2)$ in the line L is (α,β,γ),then $\alpha+\beta+6\gamma$ is equal to

24) If $\int \operatorname{cosec}^2 x dx = \alpha \cot x \operatorname{cosec} x\left(\operatorname{cosec}^2 x + \frac{3}{2}\right) + \beta log_e \left|\tan \frac{x}{2}\right| + C$ where $\alpha,\beta \in R$ and C is the constant of integration,then the value of $8(\alpha+\beta)$ equal

25) Let f:R→R be a thrice differential function such that $f(0)=0, f(1)=1, f(2)=-1, f(3)=2$ and $f(4)=-2$.Then the minimum number of zeroes of$(3f'f'' + ff''')(x)$ is

26) There are 4 men and 5 women in Group A,and 5 men and 4 women in Group B.If 4 persons are selected from each group,then the number of ways of selecting 4 men and 4 women is

27) Let A be a 2×2 symmetric matrix such that A$\begin{pmatrix}1\\1\end{pmatrix}$=$\begin{pmatrix}3\\7\end{pmatrix}$ and the determinent of A be 1.If $A^{-1}=\alpha A+\beta I$,where I is an identity matrix of order 2×2,then $\alpha+\beta$ equals to

28) Consider a triangle ABC having the vertices $A(1,2), B(\alpha,\beta), C(\gamma,\delta)$ and angles $\angle ABC=\frac{\pi}{6}$ and $\angle BAC=\frac{2\pi}{3}$.If the points B and C lie on the line $y=x+4$,then $\alpha^2+\gamma^2$ is equal to

29) Consider the function f:R→R defined by $f(x)=\frac{2x}{\sqrt{1+9x^2}}$.If the composition of f,$(f\circ f\circ f\circ\cdots\circ f)(x)=\frac{2^{10}x}{\sqrt{1+9\alpha x^2}}$,then the value of $\sqrt{3\alpha+1}$ is equal to

30) Let $S=\left\{\sin^2 2\theta : \left(\sin^4\theta+\cos^4\theta\right)x^2 + (\sin 2\theta)x + \left(\sin^6\theta+\cos^6\theta\right) = 0\right\}$ has real roots.If α and β be the smallest and largest elements of the set S,respectively,then $3\left((\alpha-2)^2+(\beta-1)^2\right)$ equals