# 2020-Jan-9 Shift-1

AI24BTECH11003 - Badde Vijaya Sreyas

16) If for all real triplets $(a,b,c)$, $f(x)=a+bx+cx^2$; then $\int_0^1 f(x)\,dx$ is equal to

a) $2\left(3f(1)+2f\left(\frac{1}{2}\right)\right)$
b) $\left(\frac{1}{3}\right)\left(f(0)+f\left(\frac{1}{2}\right)\right)$
c) $\left(\frac{1}{2}\right)\left(f(1)+3f\left(\frac{1}{2}\right)\right)$
d) $\frac{1}{6}\left(f(0)+f(1)+4f\left(\frac{1}{2}\right)\right)$

17) If the number of five digit numbers with distinct digits and 2 at the $10^{th}$ place is $336k$, then $k$ is equal to:

a) 8 b) 7 c) 4 d) 6

18) Let the observations $x_i\,(1\le i\le 10)$ satisfy the equations, $\sum_{i=1}^{10}(x_i-5)=10$ and $\sum_{i=1}^{10}(x_i-5)^2=40$. If $\mu$ and $\lambda$ are the mean and variance of observations, $(x_1-3),(x_2-3).....(x_10-3)$, then the ordered pair $(\mu,\lambda)$ is equal to:

a) $(6,3)$ b) $(3,6)$ c) $(3,3)$ d) $(6,6)$

19) The integral $\int \frac{dx}{(x+4)^{\frac{8}{7}}(x-3)^{\frac{6}{7}}}$ is equal to

a) $-\left(\frac{x-3}{x-4}\right)^{-\frac{1}{7}}+C$
b) $\frac{1}{2}\left(\frac{x-3}{x-4}\right)^{\frac{3}{7}}+C$
c) $\left(\frac{x-3}{x-4}\right)^{\frac{1}{7}}+C$
d) $-\frac{1}{13}\left(\frac{x-3}{x-4}\right)^{-\frac{13}{7}}+C$

20) In a box, there are 20 cards out of which 10 are labelled as A and remaining 10 are labelled as B. Cards are drawn at random, one after the other and with replacement, till a second A-card is obtained. The probability that the second A-card appears before the third B-card is:

a) $\frac{15}{16}$ b) $\frac{9}{16}$ c) $\frac{13}{16}$ d) $\frac{11}{16}$

21) If the vectors $\vec{p}=(a+1)\hat{i}+a\hat{j}+a\hat{k}$, $\vec{q}=a\hat{i}+(a+1)\hat{j}+a\hat{k}$, and $\vec{r}=a\hat{i}+a\hat{j}+(a+1)\hat{k}$ $(a\in R)$ are coplanar and $3\left(\vec{p}\cdot\vec{q}\right)^2-\lambda\left|\vec{r}\times\vec{q}\right|^2=0$, then the value of $\lambda$ is

22) The projection of the line segment joining the points $(1,-1,3)$ and $(2,-4,11)$ on the line joining the points $(-1,2,3)$ and $(3,-2,10)$ is

23) The number of distinct solutions of the equation $\log_{\frac{1}{2}}|\sin x|=2-\log_{\frac{1}{2}}|\cos x|$ in the interval $[0,2]$ is:

24) If for $x\ge 0$, $y=y(x)$ is the solution of the differential equation $(1+x)\,dy=\left[(1+x)^2+y-3\right]dx$, $y(2)=0$, then $y(3)$ is equal to:

25) The coefficient of $x^4$ in the expansion of $(1+x+x)^{10}$ is