SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc.Statistics - END SEMESTER EXAMINATIONS - NOV'2024
SEMESTER - I
20USTAT1001 - Allied Mathematics - I

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Find the sum to infinity of $1 - \frac{1}{4} + \frac{1.3}{4.8} - \frac{1.3.5}{4.8.12} + ...\infty$.
2. Show that $\log\left(\frac{4}{e}\right) = \frac{1}{1.2} - \frac{1}{2.3} + \frac{1}{3.4} - \frac{1}{4.5} + ...$
3. Find the nth derivative of $\frac{7x-1}{6x^2-5x+1}$.
4. If $p = 3x + 2y - z$, $q = x - 2y + z$, $w = x + 2y - z$ find $\frac{\partial(p,q,r)}{\partial(x,y,z)}$.
5. Find the maxima or minima of $f(x,y) = 2(x-y)^2$ - x^4 - y^4.
6. Expand $\cos 7\theta$ in powers of $\cos\theta$ and $\sin 7\theta$ in powers of $\sin\theta$.
7. Evaluate $\int_0^{\pi/2} \sin^9 x dx$.
8. Find the reduction formula for $\int x^m (logx)^n dx$.

Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Evaluate $\sum_{n=0}^{\infty} \frac{n^2+5}{(n+1)!} x^n$.
10. Find the nth derivative with respect to x of $x^2\ cos3x$.
11. If $x + y + z = u$, $y + z = uv$, $z = uvw$, find $\frac{\partial(x,y,z)}{\partial(u,v,w)}$.
12. Expand $cos^8\theta$ in a series of cosines of multiples of θ.
13. Evaluate $\int_0^{\pi/2} sin^9\ x\ cos^5 x\ dx$.

*****