

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. CS WITH AI - END SEMESTER EXAMINATIONS APRIL - 2024

SEMESTER - II

**22UAIAT2002 - Allied Mathematics - II**

Total Duration : 2 Hrs. 30 Mins.

Total Marks : 60

### Section B

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

1. Evaluate  $\int x^4 e^x dx$ .
2. Evaluate a)  $\int_0^{\pi/2} \sin^7 x dx$       b)  $\int_0^{\pi/2} \cos^{12} x dx$
3. Find the constant  $a_0$  of the fourier series  $f(x) = x, 0 \leq x \leq 2\pi$
4. Solve  $(D^2 + 2D + 1)y = e^x$
5. Form a partial differential equation by eliminating the constants  $a$  and  $b$  from the equation  $z = (x + a)(y + b)$
6. Splve:  $pq = y$
7. Find  $L(3\cosh 2t)$
8. Find  $L\left(e^t + \frac{1}{e^t}\right)^2$ .

### Section C

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

9. Derive the reduction formula for  $\int_0^{\pi/2} \sin^2 x dx$ .
10. Obtain the Fourier series for  $f(x) = \pi - x, 0 \leq x \leq 2\pi$
11. Solve:  $(D^2 - 4D + 13)y = e^{2x} \cos 3x$ .
12. Solve:  $xp + zq = y$ .
13. Evaluate  $L(e^{-5t} \cos^2 t)$ .

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