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.
M.Sc.Physics - END SEMESTER EXAMINATIONS - NOV' 2024
SEMESTER - I

22PPHCT1001 - Mathematical Physics

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

Section B

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

1. State and prove the Schwartz inequality.
2. Explain an orthonormal basis.
3. Show that $np_n(x) = (2n-1)xp_{n-1}(x)$ - $(n-1)p_{n-1}(x)$.
4. Express orthogonality of eigen functions using hermite polynomials.
5. Obtain the Taylor's series expansions.
6. Whether in Z is an analytic function of the complex variable Z= X+iY? Justify your answer.
7. Explain linearity property of Laplace transforms.
8. State and prove schur's Lemmas II.

Section C

I - Answer any **TWO** questions $(2 \times 10 = 20$ Marks)

9. Explain the Gram-schmidt orthogonalisation process obtain them.
10. State and prove the orthogonal property of legendre polynomials.
11. Obtain Cauchy's-Reimann equations in polar form.
12. Derivative the Laplace transform of the derivative and integral of Laplace transform.

II - Compulsory question $(1 \times 10 = 10$ Marks)

13. Briefly explain Great orthogonality theorem.

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