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.Applicable Mathematics - END SEMESTER EXAMINATIONS - NOV'2024
SEMESTER - III
20PAMCT3007 - Complex Analysis

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 Fundamental Theorem of Algebra.

2. State and prove Morera's Theorem.

3. Show that for $a > 1$, $\displaystyle\int_0^\pi \frac{d\theta}{a + cos\theta} = \frac{\pi}{\sqrt{a^2 - 1}}$.

4. State and prove Schwarz's Lemma.

5. Prove that if $|z| < 1$ and $p > 0$, then $|1 - E_p(z)| < |z|^{p+1}$.

6. State and prove Mean Value Theorem.

7. Prove that Poisson Kernel satisfies $\displaystyle\int_{-\pi}^\pi p_r(\theta)d\theta = 2\pi$.

8. State Jensen's and Poisson-Jensen Formula.

Section C

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

9. Show that $\displaystyle\int_0^\infty \frac{sinx}{x}dx = \frac{\pi}{2}$.

10. State and prove Riemann Mapping Theorem.

11. State and prove Harnack's Theorem.

12. State and prove Bloch's Theorem.

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

13. State and prove Goursat's Theorem.

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