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**Department of Research & Development**  
**Mid - Term Examinations - SEPTEMBER 2024**

<b>Odd Semester:</b> Ph.D. Course Work	<b>Date:</b> 28 /09/2024
<b>Course Code:</b> MAT 802	<b>Time:</b> 2:00pm – 3:30pm
<b>Course Name:</b> Advanced Complex Analysis	<b>Max Marks:</b> 50
<b>Department:</b> Mathematics	<b>Weightage:</b> 25%

**Instructions:**

- (i) Read all questions carefully and answer accordingly.
- (ii) Do not write anything on the question paper other than roll number.

**Part A**

<b>Answer ALL the Questions. Each question carries 5 marks.</b>		<b>4Qx5M=20M</b>
<b>1</b>	State Argument Principle Theorem.	<b>5 Marks</b>
<b>2</b>	State Laurent's series.	<b>5 Marks</b>
<b>3</b>	Evaluate $\int_{-\infty}^{\infty} \frac{x^2-x+2}{x^4+10x^2+9} dx$ .	<b>5 Marks</b>
<b>4</b>	Prove that elliptic function without pole is a constant.	<b>5 Marks</b>

**Part B**

<b>Answer ALL Questions. Each question carries 15 marks.</b>		<b>2QX15M=30M</b>
<b>5</b>	State and prove Laurent's series.	<b>15 Marks</b>
<b>6</b>	State and prove Rouché's theorem.	<b>15 Marks</b>