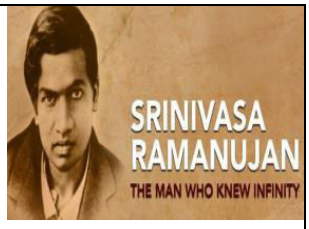

SRM Institute of Science and Technology

Kattankulathur

DEPARTMENT OF MEATHEMATICS

18MAB102T ADVANCED CALCULUS & COMPLEX ANALYSIS

UNIT –V Complex Integration and Cauchy's Theorem

Tutorial Sheet -1

Sl.No.	Questions	Answer
	Part – A	
1	Evaluate $\int_C \frac{dz}{z-a}$, where C is the circle $\lvert z-a\rvert = r$.	$2\pi i$
2	Evaluate $\int_C (z-a)^n dz\,[n, \text{any integer} \neq -1]$, where C is the circle $\lvert z-a\rvert = r$.	0
3	Evaluate $\int_0^{1+i} (x^2+iy)\,dz$, along the paths $y=x$ and $y=x^2$.	$\frac{1}{6}(5i-1)$
4	State Cauchy's Theorem and Cauchy's integral formula.	
5	Evaluate $\int_C \frac{e^{2z}}{(z-1)(z-2)}dz$, where C is the circle $\lvert z\rvert = 3$.	$2\pi i\left(e^4-e^2\right)$
	Part – B	
6	Evaluate $\int_C \frac{\cos \pi z^2}{(z-1)(z-2)}dz$, where C is the circle $\lvert z\rvert = 3$.	$4\pi i$
7	Evaluate $\int_C \frac{e^{2z}}{(z+1)^4}dz$, where C is the circle $\lvert z\rvert = 2$.	$\frac{8\pi i}{3}e^{-2}$
8	Evaluate $\int_C \frac{\cos \pi z}{z^2-1}dz$, where C is the rectangle with vetices $2\pm i$, $-2\pm i$.	0
9	Evaluate $\int_C \frac{ze^{2z}}{(z-1)^3}dz$, where C is the circle $\lvert z+i\rvert = 2$.	$8\pi i e^2$
10	Evaluate $\int_C \frac{z^3-2z+1}{(z-i)^2}dz$, where C is the circle $\lvert z\rvert = 2$.	$-10\pi i$

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