

TEZPUR UNIVERSITY
Assignment (Spring) 2018
MMS201: Complex Analysis

Total Marks: 30

The figures in the right-hand margin indicate marks for the individual question.

All questions are compulsory.

Answers should be concise and entire answer to a question should be together. State assumptions wherever made.

1. Find the domain and co-domain of the following function:

2+2

$$f(z) = \frac{1}{1 - |z|^2}.$$

2. Let f and g be two complex functions such that

$$\lim_{z \rightarrow z_0} f(z) = l_1 \quad \lim_{z \rightarrow z_0} g(z) = l_2.$$

Show that $\lim_{z \rightarrow z_0} [f(z) + g(z)] = l_1 + l_2$.

5

3. Check the differentiability of the function $f(z) = \bar{z}^2$ at $z = 0$.
 (Do not use Cauchy-Riemann equations.)

5

4. Define an entire function. Give an example of an entire function. Verify that your function is entire. **2+2+4**

5. Use Cauchy-Riemann equations to check whether functions are differentiable or not ?

3+5

- (i) $f(z) = z - \bar{z}$ (ii) $f(z) = z(Im \ z)$.

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