TEZPUR UNIVERSITY
Assignment (Spring) 2020
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. Express the function $f(z) = z/(z + i)$, $z + i \neq 0$ in polar co-ordinates. **2**

2. Describe the domain and co-domain of the following functions: **2+3**

$$f(z) = \frac{\bar{z}}{z + \bar{z}}.$$

3. Find the limit of the function $f(z) = i|z|^2/2$ as $z \to 0$ using definition. **5**

4. Check Show that if a function f is continuous and non-zero at $z = z_0$ then $f(z) \neq 0$ in some neighborhood of z_0. **4**

5. Check Cauchy-Riemann equations for the function $f(z) = \bar{z}/(1 + |z|^2)$. **6**

6. Give an example of a function which satisfies Cauchy-Riemann equations but is not differentiable. Verify your claim. **4**

7. Show that a real valued analytic function is constant. **4**

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