Assignment-18

* Required

1. Email address *

2. Name *

3. Registration No. *

4. Institute Name *

5. Question-1 * 3 points

Let

$$f(z) = \begin{cases} \bar{z}^3/z^2 & \text{if } z \neq 0 \\ 0 & \text{if } z = 0 \end{cases}$$

Show that

(a) $f(z)$ is continuous everywhere on $\mathbb{C}$;

(b) the complex derivative $f'(0)$ does not exist.

Files submitted:

6. Question-2 * 1 point

Explain why the function $f(z) = 2z^2 - 3 - ze^z + e^{-z}$ is entire.

Files submitted:

7. Question-3 * 3 points

Find an analytic function $f(z) = u(r, \theta) + iv(r, \theta)$ such that $V(r, \theta) = r^2 \cos 2\theta - r \cos \theta + 2$.

Ans. $i\,[z^2 - z + 2]$

Files submitted:

8. Question-4 * 3 points

Show that the function $u = e^{-2xy} \sin(x^2 - y^2)$ is harmonic. Find the conjugate function v and express $u + iv$ as an analytic function of z.

Ans. $v = e^{-2xy} \cos(x^2 - y^2) + C$

$f(z) = -ie^{iz^2} + C_1$

Files submitted: