VIT

Vellore Institute of Technology

(Deemed to be University under section 3 of UGC Act, 1956)

School of Advanced Sciences

Fall Semester 2024-2025

Continuous Assessment Test – I

Programme Name & Branch : BTech

Slot: A2+TA2+TAA2

Course Name & code: Complex Variables and Linear Algebra & BMAT201L

Class Number (s): Common to all A2+TA2+TAA2 slot

Exam Duration: 90 Min. **Maximum Marks: 50**

General instruction(s): Answer ALL Questions

Q.No.	Question	Max Marks
1.	Find the analytic function $f(z)=u+iv$ if $3u-2v=7x^2-7y^2+8xy$. Also find the functions u and v.	10
2.	In two dimensional fluid flows, the stream function $\emptyset = x^4-6x^2y^2+y^4$, find the velocity function and the complex potential function.	10
3.	Under the transformation $w=\frac{1}{z}$, find the image of i. The straight line $y-x+1=0$ ii. The circle $\lvert z-3i\rvert=3$	10
4.	Find the transformation which maps the points $1, i, -1$ of z-plane onto $-1, 0, 1$ of the w-plane respectively and find the invariant points. Also find the image of a circle $\lvert z\rvert<1$ under this transformation.	10
5.	Expand the functions in Laurent's series $f(z)=\frac{1}{(z+1)(z-3)}$ in the region i. $0<\lvert z-3\rvert<1$ ii. $1<\lvert z-2\rvert<3$	10

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