



SCHOOL OF ADVANCED SCIENCES

CONTINUOUS ASSESSMENT TEST – I

FALL SEMESTER 2025-2026

SLOT: A1+TA1+TAA1

Programme Name & Branch : B. Tech (Common)  
Course Code : BMAT201L  
Course Name : Complex Variables and Linear Algebra  
Class Number(s) : Common question paper for this slot

Exam Duration: 90 minutes

Maximum Marks: 50

General instruction(s):

Answer all the Questions

5X10=50

Q.No.	Question	Max Marks	CO	BL
1.	Show that the function $f(z) = \begin{cases} \frac{x^3(1+i) - y^3(1-i)}{x^2 + y^2}, & z \neq 0 \\ 0, & z = 0 \end{cases}$ is not regular at the origin, although C-R equations are satisfied at the origin.	10	CO1	BL2
2.	An incompressible fluid flowing over the $xy$ -plane has the velocity potential $\phi = x^2 - y^2 + \frac{x}{x^2 + y^2}$ . Examine if this is possible and find a stream function.	10	CO1	BL3
3.	Find the bilinear transformation that maps the points $2, i, -2$ into $1, i, -1$ respectively. Also find the invariant points.	10	CO2	BL2
4.	Find the image of the infinite strip $\frac{1}{4} \leq y \leq \frac{1}{2}$ in the $z$ -plane under the transformations $w = \frac{1}{z}$	10	CO2	BL2
5.	Obtain the expansions for $f(z) = \frac{z^2 - 4}{z^2 + 5z + 4}$ which are valid when (i) $ z  < 1$ (ii) $1 <  z  < 4$	10	CO2	BL2