

K. J. Somaiya College of Engineering, Mumbai-77
(Constituent College of Somaiya Vidyavihar University, Mumbai)

Semester: I Oct 2021-Feb 2022

In-Semester Examination (Demo/Mock exam)

Class: F.Y. B. Tech

Branch: All Branches

Full name of the course: Applied Mathematics-I

Duration: 15 min (attempting questions) +15 min (uploading)

Semester : I

Course Code: 116U06C101

Max. Marks: 09

Q. No	Questions	Marks
Q1	Choose the correct option from the following MCQ (1 MARK EACH)	4 marks
1.1	Value of $(1 + i)^{100}$ is (A) $2^{100}(\cos 100\pi + i \sin 100\pi)$ (B) $2^{100}(\cos 25\pi + i \sin 25\pi)$ (C) $2^{50}(\cos 100\pi + i \sin 100\pi)$ (D) $2^{50}(\cos 25\pi + i \sin 25\pi)$	
1.2	Value of $\log(-1)$ is (A) $i\pi$ (B) <i>does not exist</i> (C) π (D) 0	
1.3	For any square matrix A, which of the following is not correct ? (A) $(A^{-1})^T = (A^T)^{-1}$ (B) $(\bar{A})^{-1} \neq \overline{A^{-1}}$ (C) $(\bar{A})^{-1} = \overline{A^{-1}}$ (D) $(\bar{A})^T = \overline{A^T}$	
1.4	Rank of $A = \begin{bmatrix} 1 & 2 & -2 & 3 \\ -1 & -3 & 2 & -2 \\ 0 & -1 & 0 & 1 \\ -1 & -4 & 2 & -1 \end{bmatrix}$ is (A) 4 (B) 1 (C) 2 (D) 3	
Q2	Attempt any ONE of the following	
(a)	If α, β are the roots of the equation $x^2 - 2\sqrt{3}x + 4 = 0$, Prove that $\alpha^3 + \beta^3 = 0$ and $\alpha^3 - \beta^3 = 16i$	5 marks
(b)	Separate into real and imaginary parts $\tan^{-1}(\alpha + i\beta)$	5 marks