

JC BOSE UNIVERSITY OF SCIENCE & TECHNOLOGY , YMCA , FARIDABAD

22001008023

2nd SESSIONAL EXAM (June 2023)

B.TECH 2nd SEM ECE --MATHEMATICS

TIME-1Hr,30 min

MM-15

NOTE: All questions are compulsory

Q1: Prove that the function $u = e^x(x \cos y - y \sin y)$ satisfies Laplace's equation and find the corresponding analytic function $f(z)=u + iv$.

Q2: Evaluate the following integrals using Cauchy's integral formula.

$$\int_C \frac{e^{2z}}{(z-1)(z-2)} dz, \text{ where } C \text{ is the circle } |z|=3.$$

Q3: Evaluate using Cauchy residue theorem,

$$\int_C \frac{z-1}{(z+1)^2(z-2)} dz, \text{ where } C \text{ is } |z-i|=2.$$