Roll No. .....

Y – 3175

M.A./M.Sc. (Second Semester)
EXAMINATION, May/June 2021
MATHEMATICS
Paper – 201
(Complex Analysis)

Time : Three Hours

Maximum Marks : 85 *Minimum Pass Marks : 29*

Note : Attempt *all* questions.

Unit-I

1. Define power series. The sum function $f(z)$ of the series $\sum_{n=0}^{\infty} a_n z^n$ represents an analytic function inside its circle of convergence. 17

Unit-II

2. If $f(z)$ is an integral function and is bounded for all values of z, then it is constant. 17

Unit-III

3. If $w = f(z)$ represents a conformal transformation of a domain D in the z-plane into a domain D' of the w-plane then $f(z)$ is an analytic function of z in D'. 17

Unit-IV

4. State and prove Hurwitz's theorem. 17

Unit-V

5. Apply the calculus of residues to prove that : 17

$$\int_0^{\infty} \frac{\cos mx}{a^2 + x^2}\, dx = \frac{\pi}{2a}\, e^{-ma}$$

where $m \geq 0$, $a > 0$.