M.A Semester –II

Assignment

Subject- Mathematics

Course– Complex Analysis II

Subject Course No.-DEMATH2ELEC5

Total Marks-25

Group-A

Answer any one of the following questions (15 marks)

1. Let f be an entire function of finite order λ, then prove that f has finite genus $\mu \leq \lambda$. Furthermore, if λ is not an integer, then show that f has infinitely many zeros.
2. (a) Define Weierstrass elementary factor $E_p(z)$ for p=0,1,2,..... Show that if $|z| \leq 1 and\ p \geq 0$ then $|1 - E_p(z)| \leq |z|^{p+1}$.
   (b) Prove that a harmonic function is an open map.

Group-B

Answer any one of the following questions (10marks)

1. Suppose that $a_k \geq 0$ for all $k \in \mathbb{N}$. Then prove that the series $\sum_{k=1}^{\infty} a_k$ converges absolutely if and only if the series $\sum_{k=1}^{\infty} Log(1 + a_k)$ converges absolutely.
2. Determine whether the following statement is true or false. Justify your answer with a proof or a counterexample.
   For any two entire functions f and g, $\lambda(f + g) = \max\{\lambda(f), \lambda(g)\}$ whenever $\lambda(f) \neq \lambda(g)$.