M.A Semester –II

Assignment

Subject- Mathematics

Course –Point set Topology

Subject Course No.-DEMATH2CORE2

Total Marks-25

Group-A

Answer **any one** of the following questions (15 marks)

1. Let X be a topological space. Then prove that following are equivalent
   (1) X is compact space.
   (2) Every filter has a cluster point.
   (3) Every filter has a convergent sub-filter.
2. Define a metrizable space. If $\mathcal{A}$ is an open covering of a metrizable space X, then prove that there is an open covering $\boldsymbol{\mathcal{C}}$ of X refining A that is countably locally finite.

Group-B

Answer **any one** of the following questions (10marks)

1. Let $f: X \rightarrow Y$such that Y be a compact Hausdorff space. Prove that f is continuous if and only if the graph of f,
   $$G_f = \{x \times f(x) | x \in X\},$$
   is closed in $X \times Y$.
2. Define Paracompact space. Prove that every Paracompact Hausdorff space X is T_4.