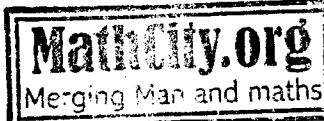13161

University of Sargodha

M.A/M.Sc. Part- I, 1st Annual Exam 2010

Math- V   Topology & Functional Analysis

Maximum Marks: 60

Time Allowed: 2:15 Hours

Subjective Part

Note: **Attempt any three questions. All questions carry equal marks.**

Q.3.   a.   Prove that every metric topology is a topology.

   b.   Show that any uncountable set with co finite topology is not first countable.

Q.4.   a.   Define the co finite topology and prove that it is a topology. Is there any relation between a co finite topology and discrete topology defined on a finite set?

   b.   Show that C [a, b] the set of all continuous functions is a Banach Space.

Q.5.   a.   Show that any two equivalent norms on a normed linear space have the same topology.

   b.   State and prove Minkowski's Inequality.

Q.6.   a.   Show that every totally bounded metric space is compact.

   b.   Prove that the Real line with usual topology is a T_2 space.

7.   a.   Show that continuous image of a connected space is connected.

   b.   Show that R is not compact.