University of Sargodha

M.A/M.Sc. Part-I/Composite, 1st A-Exam 2016

Mathematics: V Topology & Functional Analysis

Maximum Marks: 100 Time Allowed: 3 Hours

Note: Objective part is compulsory. Attempt any four questions from subjective part.

Objective Part (Compulsory)

Q.1. Write short answers of the followings on your answer sheet: (2*10)

(i) Let A be the subset of a space X, then prove that $Int(A) \cup Bd(A) = Cl(A)$

(ii) Define homeomorphism with an example.

(iii) Define Normal space with an example.

(iv) Prove that every T_1-Space is T_0-Space.

(v) Define Compact space with an example.

(vi) Define Euclidean metric.

(vii) Define Cauchy-Schwarz inequality.

(viii) Explain product of metric spaces.

(ix) Define bounded linear functional.

(x) What is Usual topology in R^2?

Subjective Part (4*20)

Q.2. Prove that Separability is an open hereditary property.

Q.3. Prove that a completely regular space is also regular space.

Q.4. Let A be a subset of a topological space (X, τ) and let τ_A be the relative topology on A. Then A is τ-connected if and only if A is τ_A-connected.

Q.5. State and prove Minkawski inequality for sum.

Q.6. Prove that a subspace y of a banach space X is complete if and only if the set Y is closed in X.

Q.7. Prove that the space l^p with $p \neq 2$ is not an inner product space, hence not the Hilbert space.