

GDB No. 2

Q.Explain in detail why an indiscrete space (X, τ) where X consists of more than one point is not metrizable.

Solution.

An indiscrete space (X, \mathcal{J}) where X consists of more than one point is not metrizable. For X and \emptyset are the only closed sets in an indiscrete space (X, \mathcal{J}) . But by Corollary 8.7 all finite sets in a metric space are closed. Hence X and \emptyset cannot be the only closed sets in a topology on X induced by a metric. Accordingly, (X, \mathcal{J}) is not metrizable.

Note: Corollary 8.7 is given in Schaum's Outline book "General topology page no. 115.