

Raniganj Girls' College
Department of Mathematics
5th semester
(TOPOLOGY)

Some Important questions

1. In a topological space (X, T) , let A be a sub set of X . Then prove that $cl(A) = A \cup D(A)$; where $D(A)$ =Derived set of A . (3)
2. Define topological property. Define continuous function in terms of closed set in a topological space. (2+2=4)
3. Show that (a, b) is open in R_1 . (2)
4. Define local base. (2)
5. Define Interior points of a set in topological space. (1)
6. Show that the collection $S = \{\pi_1^{-1}(U) : U \text{ is open in } X\} \cup \{\pi_2^{-1}(V) : V \text{ is open in } Y\}$ is a sub basis for the product topology $X \times Y$, where π_1 and π_2 are the projections of $X \times Y$ onto its first and second factors respectively.
7. Let (X, P) and (Y, Q) be two topological spaces then prove that a mapping $f: X \rightarrow Y$ is closed iff $f(cl A) \supseteq cl(f(A))$; for all A in X . (5)
8. Let (X, P) and (Y, Q) be two topological spaces , then prove that a function $f: X \rightarrow Y$ is P - Q continuous iff for every sub set B of Y ,

$$f^{-1}(int B) \supseteq int(f^{-1}(B)). \quad (5)$$