COMSATS University Islamabad
Attock Campus

Department of Mathematics
Quiz/Assignment # 01

Class: RMT & PMT
Subject: Topology
Instructor: Dr. Atiq ur Rehman

Due Date: 23-09-2024
Course Code: MTH631, MTH731
Marks: 9

Note: Every student must submit a handwritten assignment.

Question # 1: Define topological space. Construct a cofinite topology on $\mathbb{N}$.

Question # 2: Define open and closed set in a topological space. Is the closed interval [a,b] is closed set in usual topology on $\mathbb{R}$.

Question # 3: Define limit point. Let $A = \{1 + i\}$ be subset of $\mathbb{C}$.
   (i)   What is A' in the case of discrete topology on $\mathbb{C}$.
   (ii)   What is A' in the case of indiscrete topology on $\mathbb{C}$.

Question # 4: Define closure of the set. What in closure of $A = \{1,2,3\} \cup (4,5]$ for usual topology on $\mathbb{R}$? Also write its closure in case of indiscrete topology on $\mathbb{R}$.

Question # 5: Define interior, exterior and boundary points in a topological space. Consider the topology
$$\tau = \{X, \phi, \{a\}, \{c, d\}, \{a, c, d\}, \{b, c, d, e\}\}$$
on $X = \{a, b, c, d, e\}$, and the subset $A = \{c, d, e\}$ of X. What the interior, exterior and boundary points of A.
Also if $B = \{0,1,2\} \cup (3,4) \cup (8,9]$ with usual topology on $\mathbb{R}$. Then write interior, exterior and boundary points of B.

Question 6: Define relative topology. Give two examples of the relative topology on
$X = \{a, b, c, d, e\}$ with $\tau = \{X, \phi, \{a\}, \{c, d\}, \{a, c, d\}, \{b, c, d, e\}\}$.

Academic Honesty Requirements:

You are encouraged to work with others in the completion of assignments, but it doesn't include copying. However, in the spirit of Academic Honesty, which includes crediting others for their contribution to your work, please include one of the following statements with every submitted assignment on title page:

1. I worked alone on this assignment and write myself.
2. I worked with the following: List their full names. Include their relationship to you if they are not also a member of this class.