Question Bank For PG Course

Mathematics

Paper-6A

GENERAL TOPOLOGY : PGMT-VIA

Question 1

Which of the following is/are a topology on $X = \{1,2,3,4\}$?

1. $\{\phi, X, \{1\}, \{2\}\}$
2. $\{\phi, X, \{4\}\}$
3. $\{\phi, X, \{2,3\}\}$

Question 2

Which of the following is the discrete topology on the set of integers Z?

1. $\{\phi, Z, \{1\}\}$
2. $\{\phi, Z\}$
3. $Power\ set\ of\ Z$

Question 3

What is the standard base for the Euclidean topology on the set of reals R?

Question 4

What is the derived set of the set $\{2\}$ in the discrete topology on the set of integers Z?

Question 5

What is the derived set of the set $\{1,2\}$ in the indiscrete topology on the set of reals R?

Question 6

Is the set $\{1\}$ open or closed in the cofinite topology on the set of integers Z?

Question 7

What is the closure of the set $(0,1]$ ∪ $\{2\}$ in the Euclidean topology on the set of reals R?

Question 8

Does the indiscrete topology on any set containing at least two points $form$ a T_2 $space$?

Question 9

Is the Euclidean topology on the set of reals R a compact **topology** on R?

Question 10

What are the nonempty compact sets of the Euclidean topology on the set of reals R?

Question 11

Is the subset Q of rationals in real number space with Euclidean/ standard topology connected?

Question 12

Is the union of two disconnected sets always disconnected?

Question 13

Which of the followings is/are true for the set $(0,1)$ ∪ $(2,3)$ with the usual topology of reals?

1. *connected*
2. *locally connected*
3. *disconnected*

Question 14

Is it true that every metric space is a Uniform space?

Question 15

Is T_2–topological space also a T_1-topological space?

Question 16

Which of the following is/are a topology on *the real line* R

1. $\{\phi, R, \{1\}\}$
2. $\{\phi\} \cup \{A \subset R: R - A \; is \; finite\}$
3. $\{\phi, R, \{1\}, \{2\}\}$

Question 17

Let (X, T) be a topological space where $X = \{1,2,3,4,5\}$ and $T = \{\phi, X, \{2,3\}, \{3\}\}$.
Is the subset $\{4\}$ open or closed?

Question 18

Suppose, $T_i, i = 1,2,3, \ldots$ are topologies on X. Does

$$T = \bigcap_{i=1}^{\infty} T_i$$

form a topology on X?

Question 19

What is the derived set of the set $\{2,3\}$ in the indiscrete topology on the set of integers Z?

Question 20

What is the derived set of the set of rational number Q in the co-finite topology on the set of reals R?

Question 21

Is the set $\{1\}$ open or closed in the discrete topology on the set of integers Z?

Question 22

Is the set of irrational numbers dense in $R$with respect to the usual topology on R?

Question 23

Let $f: (X, T_1) \to (Y, T_2)$ be a continuous map and C be a closed subset in (Y, T_2). Is the subset $f^{-1}(C)$ closed or open in (X, T_1)?

Question 24

Let $X = \{1,2\}$ and $T = \{\phi, X, \{1\}\}$. Is the topological space (X, T), T_0 or T_1?

Question 25

What is Tychonoff space?

Question 26

Is every metric space normal?

Question 27

Let X be an infinite set induced with co-finite topology T. Is (X, T) $compact$?

Question 28

Is compact subset in a T_2 $topological$ open or closed?

Question 29

Is the set of natural numbers N connected in the discrete topology on N?

Question 30

Let X be a non-empty set. When is a subset U of $X \times X$ called symmetric?