GIET UNIVERSITY, GUNUPUR – 765022

RD19MSC012

Roll No:

Total Number of Pages : 2 AR-19 M.Sc

M.Sc 1ST SEMESTER REGULAR EXAMINATIONS, NOV/DEC 2019-20

MTPC102-TOPOLOGY

Time: 3 Hours Max Marks: 80

The figures in the right hand margin indicate marks.

SECTION A

Q.1 Answer any four of the following: [4 X4 =16]

a	Show that the union of two topologies need not be a topology.	4marks
b	Prove that a set E is closed if and only if it's complement E^C is open	4marks
c	Prove that there does not exist a continuous, bijective function f: [0, 1) → R	4marks
d	Every closed subset of a compact space is compact.	4marks
e	A topological space X is a T_0 -space then the closures of distinct points are distinct.	4marks
f	X X Y *is connected if and only if X and Y are connected*	4marks

OR

2. Answer all questions from the following [2 x 8 =16]

a	Define topology and open sets of the topological space. Give an example for each of them	2 marks
b	Define derived set and closed set. Give an example for each of them.	2 marks
c	Give an example of a continuous function which maps a dense in itself onto a non dense in itself set.	2 marks
d	Define homomorphism, compact spaces.	2 marks
e	Define T_2-Spaces and Sequences.	2 marks
f	Explain Axioms of Countability.	2 marks
g	Define Metric Products.	2 marks
h	Metric Products (D) is perfect.	2 marks

SECTION-B

3. Answer all Questions: [16 x4 =64]

a For any set A in a topological space (X, z), $(A)^{-}$ = A ∪ d(A). where $(A)^{-}$ *is closure of A and* $d(A)$ *is deriverd set of A.* 16 marks

OR

b Prove that F^{*} is a topology for X^{*}. 16 marks

4.

a If E is a subset of a subspace (X^{*}, F^{*}) of a topological space (X, F) then E is F^{*} - compact if and only if it is F- compact. 16 marks

OR

b Space that is T_1 and limit point compact is countably compact. 16 marks

5.

a Let X be a uncountable set, and let infinity be a fixed point of X. Let F be the family of subsets G such that either (i) infinity does not belongs to G, or (ii) infinity does belongs to G and CG is finite. Fort's space (X, F) is a compact, non first axiom, Hausdorff topological space. 16 marks

OR

b In a second axiom space, every collection of nonempty disjoint, open sets is countable. 16 marks

6.

a Prove that H X H is isometric to H. 16 marks

OR

b Prove that *D is homeomorphic to K.* 16 marks