

A-824

M.Sc. II Semester ATKT Examination 2020

Subject : Mathematics

Paper : III – Topology

Max.Marks : 15

Note: All questions are compulsory.

Unit – I

1. Define with examples:
- (i) Open set
 - (ii) Closed set
 - (iii) Basis and subbasis

Or

Let Y be a subspace of X , Then a set A is closed in Y if and only if it is equal to the intersection of a closed set of X with Y . Prove it.

Unit – II

2. Define with examples:
- (i) Continuous function and homomorphism
 - (ii) Separable spaces
 - (iii) Product and box topology

Or

Suppose that X has a countable basis, then prove that:

- (i) Every open covering of X contains a countable sub collection covering X
- (ii) There exists a countable subset of X which is dense in X .

Contd...

(2)

Unit – III

3. Define with examples:
- (i) Connected spaces
 - (ii) Path component
 - (iii) Local path connectedness

Or

Prove that the image of a connected space under a continuous map is connected.

Unit – IV

4. State and prove Lebesgue number lemma.

Or

State and prove uniform continuity theorem.

Unit – V

5. state and prove Tietze extension theorem.

Or

Every compact Hausdorff space is normal. Prove it.
