**B.Sc. DEGREE EXAMINATION, APRIL 2017.**

**I YEAR — II SEMESTER**

**(For Statistics Only)**

**Allied II — ALLIED MATHEMATICS —II**

**Time : 3 hours Max. Marks : 75**

**SECTION A — (10 × 2 = 20 marks)**

**Answer any *TEN* questions.**

1. If find and also find the range of
2. Prove that the set of all integers is countable.
3. Prove that the sequence has the limit 0.
4. For the given series define  
   (a) the absolutely convergence and

(b) the conditionally convergence.

1. Define a function is differentiable at point .
2. Write Taylor’s formula with the Lagrange form of the remainder.
3. Find .
4. Find .
5. Find .
6. Find .
7. Define limit of sequence.
8. Find .

**SECTION B — (5 × 5 = 25 marks)**

**Answer any *FIVE* questions.**

1. If and if , show that
2. If the sequence of real numbers is convergent then prove that is bounded.
3. If the real-valued function has a derivative at the point , then prove that is continuous at .
4. Find .
5. Find .
6. If has a derivative at every point of , then prove that takes on every value between and .
7. State and prove second mean-value theorem for integrals.

[P.T.O.]

**SECTION C — (3 × 10 = 30 marks)**

**Answer any *THREE* questions.**

1. Prove that the countable union of countable sets is countable.
2. If be a sequence of real numbers such that

(a) and

(b) , show that the alternating series converges.

1. State and prove Rolle’s theorem.
2. Find .
3. Find .

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