B.Sc. DEGREE EXAMINATION, APRIL 2018.

I YEAR II SEMESTER

Allied - Paper II - ALLIED MATHEMATICS-II

Time : 3 Hours Max. Marks : 75

SECTION A – (10 × 2 = 20 marks)

Answer any *TEN* questions

1. When are two sets equivalent?
2. Give the binary expansion for 1/16.
3. What is a convergent sequence? Give an example.
4. Define bounded sequence. Give an example.
5. State Rolle’s theorem.
6. State the law of the mean.
7. Find Laplace transform of cos4tsin3t.
8. State the linearity property of Laplace transforms.
9. Find .
10. Find .
11. Give an example of a divergent series.
12. What is a monotone sequence?

SECTION B – (5 × 5 = 25 marks)

Answer any *FIVE* questions

1. If f : A 🡪 B and X is a subset of A, Y is a subset of B show that .
2. Prove that every convergent sequence of real numbers is bounded.
3. Prove that if the real – valued function *f* has a derivative at the point *c* then f is continuous at *c*.
4. Find 
5. Find .

[P.T.O.]

1. Prove that countable union of countable sets is countable.
2. Prove that the series is divergent.

SECTION C – (3 × 10 = 30 marks)

Answer any *THREE* questions

1. Prove that [0, 1] is uncountable.
2. Prove that
3. the limit of the sum of two convergent sequences is the sum of the limits,
4. the limit of the product of two convergent sequences is the product of the limits.
5. Establish Taylor’s formula with the integral form of the remainder.
6. Find 
7. Find .