B.Sc. DEGREE EXAMINATION, NOVEMBER 2017.

I Year II Semester

Core Major – Paper IV - INTEGRAL CALCULUS AND FOURIER SERIES

Time : 3 Hours Max. Marks : 75

SECTION A – (10 × 2 = 20 marks)

Answer any *TEN* questions

1. Evaluate: .
2. Integrate: .
3. Evaluate:
4. Change the order of integration .
5. Show that .
6. Show that .
7. Classify the function as even, odd or neither.
8. Find the value of the Fourier constant in the Fourier series expansion of in the interval .
9. Define Fourier cosine series.
10. Define Fourier series in the interval .
11. Evaluate:.
12. Evaluate:

SECTION B – (5 × 5 = 25 marks)

Answer any *FIVE* questions

1. Obtain a reduction formula for , where and are positive integers. Hence evaluate .
2. Evaluate over the region for which are each and .
3. Evaluate . Hence find the value of .
4. Express as a Fourier series with period in the interval .
5. Find the half range sine series for the function .
6. Using triple integral, find the volume of the sphere .
7. Find the Fourier series for in .

P.T.O.

SECTION C – (3 × 10 = 30 marks)

Answer any *THREE* questions

1. Obtain reduction formula for , where and are positive integers. Hence evaluate .
2. Change the order of integration and hence evaluate .
3. Show that .
4. Expand as a Fourier series in and hence deduce the sum of .
5. Obtain Fourier series for of period and hence deduce that .

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