B.Sc. DEGREE EXAMINATION, APRIL 2018.

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. Evaluate
3. Evaluate
4. Define triple integral.
5. Prove that
6. Evaluate
7. Find the constant of the Fourier series for the function in
8. Find in the expansion of as a fourier series in
9. Find a sine series for the function in
10. If in , find the value of the fourier series.
11. Evaluate
12. Evaluate

SECTION B – (5 × 5 = 25 marks)

Answer any *FIVE* questions

1. Evaluate
2. Evaluate the following integral by change of order of integration of

[P.T.O.]

1. Prove that
2. Express as a fourier series with period , to be valid in the interval 0 to .
3. Expand in a cosine series of cosines
4. Evaluate taken over the positive quadrant of the circle
5. If prove that.

SECTION C – (3 × 10 = 30 marks)

Answer any *THREE* questions

1. Find the reduction formula for and deduce the value of
2. Evaluate taken through the positive octant of the sphere
3. Express in terms of Gamma functions and evaluate the integral
4. Determine the Fourier series expansion of in the interval . Using this series obtain the sum of the series
5. If when

 = when

Expand as a sine series in the interval .