B.Sc. DEGREE EXAMINATION, APRIL 2018.

I YEAR II SEMESTER

Core Major - Paper III - CLASSICAL ALGEBRA

Time : 3 Hours Max. Marks : 75

SECTION A – (10 × 2 = 20 marks)

Answer any *TEN* questions

1. Write the expansion of
2.  (ii) .
3. If , prove that 
4. If is a skew-symmetric matrix, find .
5. Find the eigen values of the matrix .
6. Solve the equation whose roots are in Arithmetic Progression.
7. If  are the roots of the equation  find the value of  .
8. Define a reciprocal equation.
9. If  are the roots of  write the equation whose roots are .
10. Find the number of divisors and the sum of the divisors of .
11. Define . Find  and .
12. If , find .
13. Form the equation whose roots are  and .

[P.T.O.]

SECTION B – (5 × 5 = 25 marks)

Answer any *FIVE* questions

1. Find the sum to infinity the series 
2. Find the inverse matrix,  using Cayley - Hamilton theorem.
3. Solve  given that  is a root .
4. Solve 
5. Find the highest power of  in ! .
6. If  is small in comparison with show that  approximately.
7. Prove that the matrix  is unitary matrix .

SECTION C – (3 × 10 = 30 marks)

Answer any *THREE* questions

1. Sum to infinity the series 
2. Find the eigen values and eigen vectors of the matrix  .
3. Solve the equation  given that it roots are in Arithmetic Progression.
4. Solve the equation 
5. State and prove Fermat’s theorem .