B.Sc. DEGREE EXAMINATION, NOVEMBER 2017.

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 down the expansion of ( 1 – x )-p/q
2. Show that, =
3. Find the rational cubic equation whose root are 1, 3 + i√2 and 3-i√2
4. Diminish the roots of x4- 5x3 + 7x2 – 4x + 5 = 0 by 2.
5. Find the equation whose roots are the roots of x5 + 6x4 +6x3 – 7x2 + 2x -1 = 0 with the signs changed.
6. Define reciprocal equation.
7. Define Orthogonal Matrix.
8. State Cayley-Hamilton theorem.
9. Find the number of divisors and sum of the divisors of 360.
10. Find  (720).
11. Write down the expansion of ex + e-x.
12. Define Skew-Hermitian matrix

SECTION B – (5 × 5 = 25 marks)

Answer any *FIVE* questions

 13. Find the sum to infinity of the series

1. Solve the equation x4 – 5 x3 + 4 x2 + 8 x – 8 = 0 given that one of the roots is 1 -√5.
2. Change the equation 2 x4 – 3 x3 + 3x2 – x +2 = 0 into another the coefficient of whose highest term is unity.
3. Show that, the sum of two symmetric matrices is also symmetric.
4. Find the smallest number with 18 divisors.

18. Find the characteristic equation of the matrix and hence determine its inverse.

19. Sum the series to infinity

 P.T.O.

SECTION C – (3 × 10 = 30 marks)

Answer any *THREE* questions

 20. Show that,

21. Show that, the roots of the equation x3 + p x2 + q x + r = 0 are in Arithmetic

 progression if 2 p3 – 9 pq + 27 r = 0.

 22. Solve the equation 6 x5 – x4 – 43 x3 + 43 x2 + x – 6 = 0.

 23. Find the eigen values and eigen vectors of the matrix

 24. Show that, if x and y are both prime to the prime number n, then show that

 xn-1 – yn-1 is divisible by n. Deduce that, x12 – y12 is divisible by 1365.

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