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. Show that

2. Show that

3. Show that the matrix is orthogonal.

4. Show that the matrix is unitary.

5. Solve the equation one root being

6. If are the roots of find .

7. Define reciprocal equation.

8. Transform the equation into one in which the coefficient of is unity and all coefficients are integral.

9. State Fermat’s theorem.

10. State Wilson’s theorem.

11. Find the number of divisors of 480 excluding 1 and 480.

12. State Cayley-Hamilton theorem.

SECTION B – (5 × 5 = 25 marks)

Answer any *FIVE* questions

13. Find the sum to infinity of the series

14. Verify Cayley-Hamilton theorem for the matrix

15. Solve the equation two of whose roots are in the ratio 3:4

16. Find the equation whose roots are the roots of the equation increased by 2 and hence solve the equation.

17. Find the highest power of 3 dividing 1000.

18. Find the sum to infinity of the series

19.Find the remainder obtained in dividing by 47.

SECTION C – (3 × 10 = 30 marks)

Answer any *THREE* questions

20. Show that

21. Find the Eigen values and Eigen vectors of the matrix

22. Solve the equation whose roots are in arithmetic progression.

23. Solve

24.Show that is divisible by 2730.

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