B.Sc. DEGREE EXAMINATION, APRIL 2018.

I YEAR I SEMESTER

Core - Allied I - ALLIED MATHEMATICS-I

Time : 3 Hours Max. Marks : 75

SECTION A – (10 × 2 = 20 marks)

Answer any *TEN* questions

1. Show that

2. Expand :

3. Define symmetric matrix.

4. State Cayley Hamilton theorem.

5. Write the expansion of cos*nθ*

6. Find the expansion of *cos4θ.*

7. Find the imaginary part of 

8. Show that 

9. State Newton's forward difference interpolation formula.

10. Define backward difference operator.

11. Define unitary matrix.

12. What is Lagrange's interpolation formula ?

SECTION B – (5 × 5 = 25 marks)

Answer any *FIVE* questions

13. Find the sum to infinity of series $\frac{1}{10}+\frac{1.4}{10.20}+\frac{1.4.7}{10.20.30}+…$

14. Find the eigen values of the matrix 

15. Prove that 

[P.T.O.]

16. If  prove that 

17. Find a polynomial of degree four which takes the values

 x : 2 4 6 8 10

 y : 0 0 1 0 0

18. Show that 

19. Show that the matrix  is orthogonal

SECTION C – (3 × 10 = 30 marks)

Answer any *THREE* questions

20. Show that 

21. Verify Cayley – Hamilton theorem for the matrix 

22. Prove that 

23. If sin(A+iB) = *x+iy* then prove that

 i) 

 ii) 

24. Using Lagrange’s formula of interpolation find *y*(9.5) given

 *x* : 7 8 9 10

 *y* : 3 1 1 9