B.Sc. DEGREE EXAMINATION, APRIL 2018.

I YEAR I SEMESTER

Core Major - Paper II - DIFFERENTIAL CALCULUS

Time : 3 Hours Max. Marks : 75

SECTION A – (10 × 2 = 20 marks)

Answer any *TEN* questions

1. Find if

2. Find if

3. What is meant by saddle point in Maxima and minima?

4. If

5. Define curvature.

6. State the Cartesian formula for radius of curvature.

7. State the radius of curvature formula when the curve is given polar coordinates.

8. Find the co-ordinates of the centre of curvature of the curve at the point (2, 1).

9. Define Asymptotes.

10. Show that the asymptotes of the cubic cut the curve again
 in three points which lie on the line

11. State Leibnitz’s theorem.

12. State the radius of curvature formula in parametric coordinates.

SECTION B – (5 × 5 = 25 marks)

Answer any *FIVE* questions

13. Find the derivative of

14. Discuss the maxima ad minima of the function

15. Find the radius of curvature for the curve at

16. Prove that the p-r equation of the cardioids

[P.T.O.]

17. Find the asymptotes of

18. Show that the radius of curvature of the curve is

19. Find the value of the Jacobian

SECTION C – (3 × 10 = 30 marks)

Answer any *THREE* questions

20. If show that

21. If where find the minimum value of u.

22. Prove that the radius of curvature at any point of the cycloid

 is

23. If , Prove that

24. Determine the asymptotes of the curve

 and show they pass through the
 points of intersection of the curve with the ellipse