SHRIMATHI DEVKUNVAR NANALAL BHATT VAISHNAV COLLEGE FOR WOMEN
(AUTONOMOUS)
(Affiliated to the University of Madras and Re-accredited with 'A+' Grade by NAAC)
Chromepet, Chennai - 600 044.
B.Sc.Mathematics - END SEMESTER EXAMINATIONS - NOV'2024
SEMESTER - I

**20UMACT1001 - Trigonometry and Analytical Geometry of 2 Dimensions**

Total Duration : 2 Hrs.30 Mins. Total Marks : 60

## Section B

Answer any **SIX** questions $(6 \times 5 = 30$ Marks)

1. Express cos $8\theta$ in terms of sin $\theta$.
2. Prove that any two relationships between the sine and cosine hyperbolic functions.
3. Compute the logarithm of the complex number 3 + 4i.
4. Use the C + iS form to sum the series sin$\theta$ + sin2$\theta$ + sin3$\theta$ + ...
5. Derive the equation of the pair of tangents from a point to a parabola.
6. Expand tan $\theta$ in powers of $\theta$ as far as $\theta^5$.
7. Express $\cosh^6 \theta$ in terms of hyperbolic cosines of multiples of $\theta$.
8. Find the equation of the polar of a point with respect to an ellipse.

## Section C

Answer any **THREE** questions $(3 \times 10 = 30$ Marks)

9. Express $\frac{sin6\theta}{sin\theta}$ in terms of cos$\theta$.
10. Prove that $sinh^{-1} = log_e\,(x + \sqrt{x^2+1})$.
11. Find the general value of log(5 + 12i) and discuss its significance in solving complex equations.
12. Prove that $\theta$ =tan $\theta$- $\frac{tan^3\theta}{3} + \frac{tan^5\theta}{5}$ - $\frac{tan^7\theta}{7}$ + ...
13. Derive the equation of a chord in terms of its midpoint for both parabola and ellipse.

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