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. END SEMESTER EXAMINATIONS NOVEMBER-2022
SEMESTER - I

20UMACT1001 - Trigonometry and Analytical Geometry of 2 Dimensions

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

Section A

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

1. Prove that $\tan^{-1}\alpha + \tan^{-1}\beta + \tan^{-1}\gamma = n\pi$ radians expect when q = 1. If α,β,γ be the roots of the equation $x^3 + px^2 + qx + p = 0$
2. Solve, if $\frac{\sin\theta}{\theta} = \frac{5045}{5046}$, show that $\theta = 1°58'$ approximately.
3. Obtain the series for sinhx and coshx.
4. Prove that cos $(2x)$ + cosh $(2y)$ = 2, if cos $(x + iy)$ = cos θ + $i$sin θ
5. Find the logarithm of x + iy
6. Show that $\log_i i = \frac{4n+1}{4m+1}$, where m, n are integers.
7. Obtain the Gregory's series.
8. Find the locus of the mid-point of chords of the parabola which subtend a right angle at the vertex of the parabola.

Section B

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

9. Prove that tan $\frac{\pi}{11}$ tan $\frac{2\pi}{11}$ tan $\frac{3\pi}{11}$ tan $\frac{4\pi}{11}$ tan $\frac{5\pi}{11} = \sqrt{11}$
10. Separate into real and imaginary parts $\tan^{-1}$ (x + iy)
11. Prove that 2e2L = cosh2φ - cos2θ if $\log$ sin$(\theta + i\varphi)$ = L + iB.
12. Find the sum to infinity of the series
    sinα + csin$(\alpha + i\beta)$ + $\frac{c^2}{2}$ sin$(\alpha + 2\beta)$ + ... when | c | < 1.
13. Derive the equation of a chord in terms of its middle point.

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