School of Basic Sciences
Bachelor of Science Honours in Mathematics
Mid Term Examination - Nov 2023

Duration : 90 Minutes
Max Marks : 50

Sem I - C1UC103T - Trigonometry and Analytical Geometry

General Instructions
Answer to the specific question asked
Draw neat, labelled diagrams wherever necessary
Approved data hand books are allowed subject to verification by the Invigilator

1) Find the sum of nth roots of unity. — K2 (2)

2) Classify the nature of conic section $ax^2 + 2hxy + by^2 + 2gx + 2fy + c = 0$ — K1 (3)

3) Show That $e^{2\theta} = n\pi + \frac{\pi}{2} + \alpha$ If $tan(\theta + i\phi) = tan\,\alpha + i\,sec\,\alpha$ — K2 (4)

4) Show that $cot^{-1}\frac{3-2i}{3+2i} = \frac{\pi}{4} + \frac{i}{2}log\,5$ — K2 (6)

5) Simplify $\frac{1+7i}{(2-i)^2}$ in the modulus-amplitude form — K3 (6)

6) Express $\frac{1-i}{1+i}$ in the modulus-amplitude form — K3 (9)

7) *If* $sin\,\alpha + sin\,\beta + sin\,\gamma = cos\,\alpha + cos\,\beta + cos\,\gamma = 0$ show that — K4 (8)
$sin\,3\alpha + sin\,3\beta + sin\,3\gamma = 3\,sin(\alpha + \beta + \gamma)$

8) Formulate the polar equation of a conic the focus being the pole . — K4 (12)

OR

Find the equation to the plane through (α,β,γ), parallel to the plane ax+by+cz=0 — K4 (12)