

School of University Polytechnic
Diploma in Civil Engineering
Mid Term Examination - May 2024

Duration : 90 Minutes
Max Marks : 50

Sem II - N1DF201T - Applied Mathematics II

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) Explain the defferntiability of a funtion. K2 (2)
- 2) Find $y = \sin(5x^2 + x - 2)$ Then find find $\frac{dy}{dx}$ K1 (3)
- 3) Show that If $f(x) = \frac{1-x}{1+x}$, then $f(\cos\theta) = \tan^2\left(\frac{\theta}{2}\right)$. K2 (4)
- 4) Show that slop of the normal to the curve $y = x^2 + 7x$ at the point (1, 8) is -1/9. K2 (6)
- 5) Solve Differentiate w.r.t. x, the function, $e^{\sec^2 x} + 3\cos^{-1}x$. K3 (6)
- 6) Solve the maxima minima of function $f(x) = 3x^3 - 6x^2 - 5x + 7$. K3 (9)
- 7) Classify Differentiate w.r.t. $x : \sin^{-1}\left(\frac{1-x^2}{1+x^2}\right)$ K4 (8)
- 8) Examine If $y = (\cos x)^{(\cos x)^{(\cos x) \dots \infty}}$, show that $\frac{dy}{dx} = \frac{y^2 \tan x}{y \log \cos x - 1}$ K4 (12)

OR

- Examine the function $f(x) = 4x^3 - 18x^2 + 27x - 7$ has neither maxima nor minima. K4 (12)