S.B. Roll No……

APPLIED MATHEMATICS-II
2nd Exam/Common/0553/Jan'2022
(FOR 2018 BATCH ONWARDS)

Duration: 1.15Hrs. **M.Marks:25**

SECTION-A

Q1. Attempt any three questions. **3x5=15**

a. Evaluate $\lim_{x\to 1} \frac{\sqrt{3+x}-\sqrt{5-x}}{x^2-1}$

b. Find the equation of the normal to the curve $y = x^4 - 6x^3 + 13x^2 - 10x + 5$ at (1, 3)

c. If $x = a(\theta + \sin\theta), y = a(1-\cos\theta)$, $find\ \frac{d^2y}{dx^2}$.

d. Evaluate $\int \frac{dx}{x^2-4x+8}$.

e. Evaluate $\int x^2 cot^{-1}x\, dx$

f. Evaluate $\int_0^{\frac{\pi}{2}} sin^5x\, cos^7x\, dx$

g. If $x^y = e^{x-y}$, prove that $\frac{dy}{dx} = \frac{\log x}{(1+\log x)^2}$.

SECTION-B

Q2. Attempt any one question. **1x10=10**

a) Find the maximum or minimum value of function $2x^3 - 15x^2 + 36x + 10$.

b) Evaluate $\int \frac{1}{x\,(x^4+1)}\, dx$

c) Evaluate $\int_0^6 y\, dx$ by Simpson's rule given

x	0	1	2	3	4	5	6
y	0.146	0.161	0.176	0.190	0.204	0.217	0.230

d) Solve the following LPP graphically:
Maximise and minimise $z = 5x + 10y$
subject to the constraints
$x + 2y \leq 120$,
$x + y \geq 60$,
$x - 2y \geq 0$,
$x, y \geq 0$.