NEP - Semester End Examination – October 2025

Program: SYIT **Sem III** **Course:** Applied Mathematics

Program Code: UGIT01 **Course Code:** NUIT308

Duration: 1 Hour **Max. Marks:30**

Instructions:

1. All questions are compulsory with internal choice.
2. Do not mix questions from Q.1 and Q.2
3. Write clearly question and sub-question number.
4. Symbols have their usual meanings.
5. Scientific calculator fx 82 series or lower version is only permitted.

Q. 1		**Attempt any THREE of the following.**	[15]	Course Outcome	Knowledge Level
	(a)	Find $L[cos^3 t]$		CO2	L2
	(b)	Find Laplace transform of $t^4H(t-2)+t^2\delta(t-2)$, where H is a Heaviside unit step function and δ is Dirac -delta function.		CO3	L3
	(c)	Find $L^{-1}[tan^{-1}\left(\frac{1}{s}\right)]$		CO3	L3
	(d)	Find the square root of $-5+12i$.		CO1	L3
	(e)	Simplify and construct using De Moivre's theorem:$\frac{(cos3\theta+isin3\theta)^4(cos4\theta-isin4\theta)^5}{(cos4\theta+isin4\theta)^3(cos5\theta+isin5\theta)^{-4}}$		CO1	L3, L6
Q. 2		**Attempt any THREE of the following.**	[15]	Course Outcome	Knowledge Level
	(a)	Solve and verify the solution of $\frac{d^3y}{dx^3}+y=0$		CO5	L3, L5
	(b)	Solve $xyp^2+(x^2+y^2)p+xy=0$, where $p=\frac{dy}{dx}$ is solvable algebraically.		CO4	L3
	(c)	Solve $y(xy+e^x)dx-e^x dy=0$		CO4	L3
	(d)	Solve $x\frac{dy}{dx}+y=x^6y^6$		CO4	L3
	(e)	Formulate and develop the solution of $\frac{d^2y}{dx^2}-4\frac{dy}{dx}+3y=(x^2e^x)^2$		CO5	L6

--- X ---