H.T No										

Regulations: Δ18

Sreenidhi Institute of Science and Technology
(An Autonomous Institution)

Code No: 7HC16 **Date: 04-Aug-2022 (FN)**

B.Tech II-Year II- Semester External Examination, July/August - 2022 (Supplementary)
MATHEMATICS-II (Differential Calculus) - (CSE, IT and ECM)

Time: 3 Hours **Max.Marks:70**

Note: *a) No additional answer sheets will be provided.*
b) All sub-parts of a question must be answered at one place only, otherwise it will not be valued.
c) Missing data can be assumed suitably.

ANSWER ANY 5 OUT OF 8 QUESTIONS. EACH QUESTION CARRIES 14 MARKS.

Bloom's Cognitive Levels of Learning (BCLL)

Remember	L1	Apply	L3	Evaluate	L5
Understand	L2	Analyze	L4	Create	L6

			BCLL	CO(s)	Marks
1.	a)	If $x+y+z=u, y+z=uv, z=uvw,$ then evaluate $\frac{\partial(x,y,z)}{\partial(u,v,w)}$	L3	CO1	[7M]
	b)	Find the maximum and minimum values of x^3+y^3-3axy	L5	CO1	[7M]
2.	a)	Solve $x\frac{dy}{dx}+y=x^2y^6$	L5	CO2	[7M]
	b)	A body is originally at 80^0c and cools down to 60^0c in 20 minutes. If the temperature of the air is 40^0c, find the temperature of the body after 40 minutes	L2	CO2	[7M]
3.	a)	Solve $(D^2-2D+1)y=xe^x\,Sinx$	L3	CO3	[7M]
	b)	Solve $(D^2+a^2)y=tanax,$ by the method of variation of parameters	L3	CO3	[7M]
4.	a)	Find the real root of $x^3-3x-5=0$ by Bisection Method	L5	CO4	[7M]
	b)	Using Lagrange's interpolation formula find the value of y when x=10 from the following table.	L2	CO4	[7M]

x	5	6	9	11
y=f(x)	12	13	14	16

5.	a)	using the Taylor's series method, solve $y'=x^2-y, y(0)=1$ at $x=0.1, 0.2.$	L3	CO5	[7M]
	b)	Use Picard's method of approximation to find y(0.1), y(0.2) given $y'=x+y^2, y(0)=0$.	L3	CO5	[7M]
6.	a)	Find $L\left\{\int_0^t te^{-t}sin2tdt\right\}$	L5	CO6	[7M]
	b)	Using the Convolution theorem, find $L^{-1}\left\{\frac{s}{(s^2+4)^2}\right\}$	L3	CO6	[7M]
7.	a)	Find first and second order partial derivatives of x^3+y^3-3axy and verify $\frac{\partial^2 f}{\partial x\partial y}=\frac{\partial^2 f}{\partial y\partial x}$	L5	CO1	[5M]
	b)	The number N of bacteria grew at a rate proportional to N. The value of N was initially 100 and increased to 332 in one hour. What was the value of N after $1\frac{1}{2}$ hours?	L2	CO2	[5M]
	c)	Solve $(D^2-2D+1)y=e^{3x}$	L2	CO3	[4M]
8.	a)	From the following table of values of x and y, obtain $\frac{dx}{dy}$ for x=1.5	L3	CO4	[5M]

x	1.5	2.0	2.5	3.0	3.5	4.0
y	3.375	7.0	13.625	24.0	38.875	59.0

	b)	Using Euler's Method find y(0.2) given $y'=x+y, y(0)=1$ taking h=0.1.	L3	CO5	[5M]

c) Find $L\{e^t(cos2t + sinh3t\}$ L5 CO6 [4M]

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