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RAYALASEEMA UNIVERSITY COLLEGE OF ENGINEERING, KURNOOL – 518007

B. Tech II Semester (RU23) I Sessional Examinations – March-2025

DIFFERENTIAL EQUATIONS AND VECTOR CALCULUS (23SH9906)

(Common to II Semester AI, CE, CSE, ECE, and ME)

Time: 90 min **Date: 10/03/2025 FN** **Max. Marks:30**

Answer ONE FULL question from each unit **All the Questions Carry EQUAL marks**

Q. No		Question	Unit	BT Level	CO covered	Marks Allotted
1	a)	Solve $(1-x^2)\frac{dy}{dx}+2xy=x\sqrt{1-x^2}$.	I	L6	CO1	(8M)
	b)	Solve $(x^2-ay)dx=(ax-y^2)dy$.	I	L6	CO1	(2M)
		(OR)				
2	a)	A body is originally at 80^oC and cools down to 60^oC in 20 minutes. If the temperature of the air is 40^oC, find the temperature of the body after 40 minutes form the original.	I	L	CO1	(8M)
	b)	Define order of differential equation.	I	L1	CO1	(2M)
3	a)	Solve $\frac{d^2y}{dx^2}+y=Cosecx$.	II	L5	CO2	(8M)
	b)	Solve $(D^3-14D+8)y=0$.	II	L6	CO2	(2M)
		(OR)				
4	a)	Solve $(D^2-3D+2)y=coshx$	II	L6	CO2	(8M)
	b)	Solve $(D^4+16)y=0$.	II	L6	CO2	(2M)
5	a)	Solve $\frac{d^2y}{dx^2}-y=\frac{2}{1+e^x}$ by the method of variation of parameters.	II	L6	CO3	(8M)
	b)	Find the Wronskian of the functions e^xsinx, e^xcosx	II	L4	CO3	(2M)
		(OR)				
6	a)	Solve $(D^2+a^2)y=Sec\ ax$ by the method of variation of parameters.	II	L6	CO3	(8M)
	b)	Solve $(D^4+8D^2+16)y=0$.	II	L6	CO3	(2M)