CRM08	Rev 1.11	BS	31/03/22

CONTINUOUS INTERNAL EVALUATION - 3

Dept:BS (MAT)	Sem / Div:1/ F	Sub: Calculus and Differential Equations	S Code: 21MAT11
Date: 06-04-22	Time: 9:30-11:00	Max Marks: 40	Elective: N

Note: Answer any 2 full questions, choosing one full question from each part.

QN	Questions	Marks	RBT	CO's
	PART A			
1 a	Solve : $(4D^4 - 8D^3 - 7D^2 + 11D + 6)y = 0$	6	L2	CO3
b	Solve : $(D^2 + 4)y = x^2 + \cos 2x$	7	L2	CO3
c	Find the general solution of the equation $(px - y)(py + x) = a^2 p$ by reducing into Clairaut's form, taking the substitutions $X = x^2$, $Y = y^2$.	7	L1	CO3
	OR			
2 a	Solve : $(1+x)^2 \dfrac{d^2 y}{dx^2} + (1+x)\dfrac{dy}{dx} + y = \sin[2\log(1+x)]$	6	L2	CO3
b	Solve : $(D^2 + 1)y = \tan x$, using the method of variation of parameters.	7	L3	CO3
c	Solve : $y\left(\dfrac{dy}{dx}\right)^2 + (x - y)\dfrac{dy}{dx} - x = 0$.	7	L2	CO3

PART B

3 a	Investigate the values of λ and μ such that the system of equations : $$x+y+z=6$$ $$x+2y+3z=10$$ $$x+2y+\lambda z=\mu,$$ may have (a) unique solution (b) Infinite solution (c) No solution	6	L2	CO4
b	Solve the following system of equations by Gauss-Seidal method : $$10x+y+z=12$$ $$x+10y+z=12$$ $$x+y+10z=12$$	7	L2	CO4
c	Solve by Gauss elimination method : $$2x+y+4z=12$$ $$4x+11y-z=33$$ $$8x-3y+2z=20$$	7	L2	CO4
	OR			
4 a	Find the rank of the following matrices by elementary row transformations : $A=\begin{bmatrix} 0 & 1 & -3 & -1 \\ 1 & 0 & 1 & 1 \\ 3 & 1 & 0 & 2 \\ 1 & 1 & -2 & 0 \end{bmatrix}$	6	L1	CO4
b	Apply Gauss-Jordan method to solve the following system of equations : $$2x_1+x_2+3x_3=1$$ $$4x_1+4x_2+7x_3=1$$ $$2x_1+5x_2+9x_3=3$$	7	L2	CO4
c	Find the largest eigen value and the corresponding eigen vector of the matrix A, by using the power method by taking initial vector as $[1\ 1\ 1]^T$, $A=\begin{bmatrix} 2 & -1 & 0 \\ -1 & 2 & -1 \\ 0 & -1 & 2 \end{bmatrix}$	7	L3	CO4

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