Vivekananda College of Engineering & Technology, Puttur [A Unit of Vivekananda Vidyavardhaka Sangha Puttur ®] Affiliated to VTU, Belagavi & Approved by AICTE New Delhi			
CRM08	Rev 1.10	BS	11/03/22

CONTINUOUS INTERNAL EVALUATION - 3

Dept:BS	Sem / Div: III/A&B	Sub: Transform Calculus, Fourier Series ad Numerical Techniques	S Code: 18MAT31
Date: 16/03/2022	Time: 9:30-11:00 am	Max Marks: 50	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	Using Taylor's series Method, find the solution at x=0.1 of $\frac{dy}{dx}=-x-y^2, y(0)=1$ considering upto fourth degree term	8	L2	CO4
	b	Solve $\frac{dy}{dx}=x+\lvert\sqrt{y}\rvert, y(0)=1 \, at \, x=0.4$ by taking h=0.2 using Modified Euler's Method, carry out two iterations in each step.	8	L2	CO4
	c	Apply Milne's Predictor corrector formula to compute y(2.0) given $\frac{dy}{dx}=\frac{1}{2}(x+y)$ with y(0)=2, y(0.5)=2.6360, y(1.0)=3.5950, y(1.5)= 4.9680	9	L2	CO4
		OR			
2	a	Use Modified Euler's Method to compute y(0.1), given that $\frac{dy}{dx}=x^2+y, y(0)=1$ by taking h=0.05.Perform two approximations in each step.	8	L2	CO4
	b	Use Runge Kutta Method of fourth order to solve	8	L2	CO4

		$(x+y)\frac{dy}{dx}=1, y(0.4)=1$ to find y(0.5) take as h=0.1			
	c	Given $y'=x^2(1+y)$,y(1)=1, y(1.1)=1.2330, y(1.2)=1.5480, y(1.3)=1.9790, Find y(1.4) using Adam's Bashforth Method	9	L2	CO4
		PART B			
3	a	Find the curve on which the functional $\int_0^1 [(y')^2+12xy]dx$ can be extremised with y(0)=0, y(1)=1	8	L3	CO5
	b	Apply Milne's Predictor Corrector Method to compute $\frac{d^2y}{dx^2}=1+\frac{dy}{dx}$ at y(0.4) with the initial values in table.	8	L2	CO4
	c	Prove that geodesics of a plane surface are straight lines.	9	L3	CO5
		OR			
4	a	Find the extremal of the functional $\int_{x_1}^{x_2} [(y')^2+y^2+2ye^x]dx$	8	L3	CO5
	b	Given y''-xy'-y=0 with the initial conditions y(0)=1 and y'(0)=0. Compute y(0.2) using Runge Kutta Method.	8	L2	CO4
	c	Derive Euler's equation in the standard form $\frac{\partial f}{\partial y}-\frac{d}{dx}[\frac{\partial f}{\partial y'}]=0$	9	L3	CO5

x	0	0.1	0.2	0.3
y	1	1.1103	1.2427	1.3990
y'	1	1.2103	1.4427	1.6990

MRPai
11/03/22
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HOD: Prof. M Ramananda Kamath
11/03/22