## 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 B5 08/02/2021

CRMU8 Rev 1.10 BS		08/	02/202	21
CONTINUOUS INTERNAL EVALUATION	1- 3	0		
ept: BS Sem / Div: III/A & B Sub: Transform Calculus,	· S	•	3MAT:	31
ate: 15/02/2021 Time: 9:30-11:00 am Max Marks: 50	El	ective:	N	177
ote: Answer any 2 full questions, choosing one full question from each	part.	emada a	dr. to da	BUUT
Questions			RBT	CO
W A	l) =1	8	L2	CO <sup>2</sup>
If $\frac{dy}{dx} = 2e^x - y$ , $y(0) = 2$ , $y(0.1) = 2.010$ , $y(0.2) = 2.040$ , $y(0.3) = 2$ find $y(0.4)$ corrected to 4 decimal places by using Milne's prediction.			L2	CO <sub>4</sub>
Given that $\frac{dy}{dx} = (1+y)x^2$ and $y(1) = 1$ , $y(1.1) = 1.233$ , $y(1.2) = 1.548$ , $y(1.3) = 1.979$ determine $y(1.4)$ by Adams-Bash forth method.		9	L2	CO <sub>4</sub>
	alue	Q	1.2	CO <sub>4</sub>
of y when $x = 0.2$ given that $\frac{dy}{dx} = x + y$ and $y=1$ when $x=0$ .	aruc	0	LZ	CO4
Given that $\frac{dy}{dx} = x^2 + y^2$ and $y(0) = 1$ , $y(0.1) = 1.245$ , $y(0.2) = 1.6043$ , $y(0.3) = 2.1235$ determine $y(0.4)$ by Adams-Bash forth method		8	L2	CO4
		Q	12	CO4
given $\frac{dy}{dx} = x - y^2$ given $y(0) = 0$ , $y(0.2) = 0.02$ , $y(0.4) = 0.0795$ ,			LZ	004
y(0.6) = 0.1762. Apply corrector formula twice.				
PART B		•		
ux ux	with	8	L3	CO4
Derive Euler's equation in the standard form viz, $\frac{\partial f}{\partial y} - \frac{d}{dx} \left( \frac{\partial f}{\partial y^1} \right) = 0$		8	L3	CO5
Prove that the Geodesics on a plane are straight lines.		9	L3	CO5
OR				
Use Milne's method to compute y(0.8) given that $\frac{d^2y}{dx^2} = 1 - 2y\frac{dy}{dx}$ and the following table of initial values.		8	L3	CO4
x 0 0.2 0.4 0.6				
y 0 0.02 0.0795 0.1762				
z = dy/dx 0 0.1996 0.3937 0.5689				
a	sept. BS   Sem / Div. III/A & B   Sub. Transform Calculus, Fourier series and Numeric Techniques   Time: 9:30-11:00 am   Max Marks: 50    te: Answer any 2 full questions, choosing one full question from each   Questions    PART A    Using Runge – Kutta method of fourth order solve   $\frac{dy}{dx} = x + y$ , $y(0.4)$ at $x = 0.5$ correct to four decimal places.  If   $\frac{dy}{dx} = 2e^x - y$ , $y(0) = 2$ , $y(0.1) = 2.010$ , $y(0.2) = 2.040$ , $y(0.3) = 2$ find $y(0.4)$ corrected to 4 decimal places by using Milne's prediccorrector method (Use corrector formula twice)  Given that $\frac{dy}{dx} = (1+y)x^2$ and $y(1) = 1$ , $y(1.1) = 1.233$ , $y(1.2) = 1.548$ , $y(1.3) = 1.979$ determine $y(1.4)$ by Adams-Bash forth method.  OR  Apply Runge – Kutta fourth order method to find an approximate v of y when $x = 0.2$ given that $\frac{dy}{dx} = x^2 + y^2$ and $y(0) = 1$ , $y(0.1) = 1.245$ , $y(0.2) = 1.6043$ , $y(0.3) = 2.1235$ , determine $y(0.4)$ by Adams-Bash forth method.  Using Milne's predictor-corrector method find y when $x = 0.8$ , given $\frac{dy}{dx} = x^2 - y^2$ given $y(0) = 0$ , $y(0.2) = 0.02$ , $y(0.4) = 0.0795$ , $y(0.6) = 0.1762$ . Apply corrector formula twice.  PART B  Using Runge-Kutta method solve $\frac{d^2y}{dx^2} = x(\frac{dy}{dx})^2 - y^2$ at $x = 0.2$ of $\frac{dy}{dx} = x^2 + y^2$ and $\frac{dy}{dx} = x^2 + y^2$ given $\frac{dy}{dx} = x^2 + y^2$ and $\frac{dy}{dx} = x^2 + y^2$ given $\frac{dy}{dx} = x^2 + y^2$ and $\frac{dy}{dx} = x^2 + y^2$ given $\frac{dy}{dx} = x^2 + y^2$ at $x = 0.2$ y $\frac{dy}{dx} = x^2 + y^2$ at $\frac{dy}{dx} = x^2 + y^2$ and $\frac{dy}{dx} = x^2 + y^2$	pt: BS   Sem / Div: III/A & B   Sub: Transform Calculus, S   Fourier series and Numerical Techniques   Techn	pt: BS Sem / Div: III/A & B Sub: Transform Calculus, Fourier series and Numerical Techniques te: 15/02/2021 Time: 9:30-11:00 am Max Marks: 50 Elective: 1 te: Answer any 2 full questions, choosing one full question from each part.  PART A  Using Runge – Kutta method of fourth order solve $\frac{dy}{dx} = x + y$ , $y(0.4) = 1$ at $x = 0.5$ correct to four decimal places.  If $\frac{dy}{dx} = 2e^x - y$ , $y(0) = 2$ , $y(0.1) = 2.010$ , $y(0.2) = 2.040$ , $y(0.3) = 2.090$ find $y(0.4)$ corrected to 4 decimal places by using Milne's predictor-corrector method (Use corrector formula twice)  Given that $\frac{dy}{dx} = (1 + y)x^2$ and $y(1) = 1$ , $y(1.1) = 1.233$ , $y(1.2) = 1.548$ , $y(1.3) = 1.979$ determine $y(1.4)$ by Adams-Bash forth method.  OR  Apply Runge – Kutta fourth order method to find an approximate value of $y(0.3) = 2.1235$ , determine $y(0.4)$ by Adams-Bash forth method.  Given that $\frac{dy}{dx} = x^2 + y^2$ and $y(0) = 1$ , $y(0.1) = 1.245$ , $y(0.2) = 1.6043$ , $y(0.3) = 2.1235$ , determine $y(0.4)$ by Adams-Bash forth method.  Using Milne's predictor-corrector method find $y(0.4) = 0.0795$ , $y(0.6) = 0.1762$ . Apply corrector formula twice.  PART B  Using Runge-Kutta method solve $\frac{d^2y}{dx^2} = x(\frac{dy}{dx})^2 - y^2$ at $x = 0.2$ with $\frac{dy}{dx} = x - y^2$ given $y(0) = 0$ , $y(0.2) = 0.02$ , $y(0.4) = 0.0795$ , $y(0.6) = 0.1762$ . Apply corrector formula twice.  PART B  Using Runge-Kutta method solve $\frac{d^2y}{dx^2} = x(\frac{dy}{dx})^2 - y^2$ at $x = 0.2$ with $\frac{dy}{dx} = x - y^2$ given $\frac{dy}{dx} = x - y^2$	pt: BS   Sem / Div: III/A & B   Sub: Transform Calculus, Fourier series and Numerical Techniques   Technique

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CONTINUOUS INTERNAL EVALUATION- 3

Find the curve on which the functional $\int_{0}^{1} [y^{2} + x^{2}y^{4}] dx$ with $y(0) = 0$ , $y(1)=1$ can be extermized.	8	L3	CO5
c A heavy cable hangs freely under gravity between two fixed points. Show that the shape of the cable is a catenary.	9	L3	CO5

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