CONTINUOUS INTERNAL EVALUATION- 3

Dept: BS	Sem / Div: II/A, B, C, D, E, F	Sub: Advanced Calculus and Numerical methods	S Code:18MAT21
Date:23-09-2021	Time: 9:30-11:00 am	Max Marks: 50	Elective: N
Note: Answer any 2 full questions, choosing one full question from each part.			

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QN		Questions	Marks	RBT	COs
		PART A			
1	a	Form the partial differential equation by eliminating the arbitrary constants from $2z=\frac{x^2}{a^2}+\frac{y^2}{b^2}$	8	L1	CO3
	b	Solve $\frac{\partial^2 z}{\partial x \partial y}=sinx\,siny$,for which $\frac{\partial z}{\partial y}=-2\,siny$ when $x=0$ and $z=0$ when y is an odd multiple of $\frac{\pi}{2}$	8	L2	CO3
	c	Solve one dimensional wave equation, using the method of separation of variables.	9	L3	CO3
		OR			
2	a	Form the partial differential equation by eliminating the arbitrary function from $f(x^2+y^2, z-xy)=0$	8	L1	CO3
	b	Solve $\frac{\partial^2 z}{\partial y^2}=z$, given that when $y=0, z=e^x$ and $z=e^{-x}$	8	L2	CO3
	c	Solve one dimensional heat equation, using the method of separation of variables.	9	L3	CO3
		PART B			
3	a	Apply Newtons backward difference formula to find y(3) given that x: -4, -2, 0, 2, 4 y: -25, 1, 3, 29, 127	8	L2	CO5
	b	Use Newton-Raphson method to find the real root of the equation $x\sin x + \cos x = 0$ near $x = \pi$. Carry out iterations up to 4 decimal places of accuracy.	8	L3	CO5
	c	Evaluate $\int_4^{5.2} log_e x\,dx$, taking 6 equal strips by applying Weddle's rule	9	L2	CO5
		OR			

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4	a	Using Newtons divided difference formula evaluate f(8) given x: 4, 5, 7, 10, 11, 13 y: 48, 100, 294, 900, 1210, 2028	8	L3	CO5
	b	Find a real root of the equation $x\log_{10}x=1.2$ by Regula Falsi method correct to four decimal places.	8	L3	CO5
	c	Evaluate $\int_0^{\frac{\pi}{2}} \sqrt{sinx}\,dx$ using Simpson's $(\frac{1}{3})^{rd}$ rule, taking 10 equal parts.	9	L2	CO5