Shravya. N. Shetty 9/11/23

Vivekananda College of Engineering & Technology, Puttur
[A Unit of Vivekananda Vidyavardhaka Sangha Puttur ®]
Affiliated to VTU, Belagavi & Approved by AICTE New Delhi

CRM08	Rev 1.14 (2022 rev)	BS	06-11-2023

CONTINUOUS INTERNAL EVALUATION - 1

Dept: BS	Sem /Div: I/AIML, CD, CSE A & B	Sub: Mathematics-I for CSE Stream	S Code: BMATS101
Date: 09/11/2023	Time: 9.30am-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	Find the angle of intersection of the curves $r^2\sin2\theta = 4$ and $r^2 = 16\sin2\theta$	8	L1	CO1
	b	Find the radius of curvature for the curve $x^3 + y^3 = 3axy$ at the point $\left(\frac{3a}{2}, \frac{3a}{2}\right)$	8	L2	CO1
	c	Solve $(y^4 + 2y)dx + (xy^3 + 2y^4 - 4x)dy = 0$	9	L2	CO3
		OR			
2	a	With usual notation prove that $\frac{1}{p^2} = \frac{1}{r^2} + \frac{1}{r^4}\left(\frac{dr}{d\theta}\right)^2$ Also, find the pedal equation of $r^2 = a^2\sec2\theta$	8	L2	CO1
	b	Show that for $\frac{2a}{r} = 1 + \cos\theta$, ρ^2 varies as r^3	8	L2	CO1
	c	Solve $\frac{dy}{dx} + \frac{y\cos x + \sin y + y}{\sin x + x\cos y + x} = 0$	9	L2	CO3
		PART B			
3	a	Using Maclaurin's series expand log(secx) upto the term containing x^6	8	L2	CO2
	b	If $u = f\left(\frac{x}{y}, \frac{y}{z}, \frac{z}{x}\right)$ then prove that $xu_x + yu_y + zu_z = 0$	8	L2	CO2

	c	Examine the function $f(x, y) = 2(x^2 - y^2) - x^4 + y^4$ for extreme values	9	L2	CO2
OR					
4	a	Evaluate $\lim_{x \to 0} \left(\frac{\tan x}{x}\right)^{1/x^2}$	8	L2	CO2
	b	If $z(x+y) = x^2 + y^2$ show that $\left(\frac{\partial z}{\partial x} - \frac{\partial z}{\partial y}\right)^2 = 4\left(1 - \frac{\partial z}{\partial x} - \frac{\partial z}{\partial y}\right)$	8	L1	CO2
	c	If $u = \frac{yz}{x}$, $v = \frac{zx}{y}$, $w = \frac{xy}{z}$ find $J\left(\frac{u, v, w}{x, y, z}\right)$	9	L2	CO2

Prepared by: M Ramananda Kamath

HOD