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

CRM08	Rev 1.11	BS	04/01/22

CONTINUOUS INTERNAL EVALUATION – 1

Dept:BS (MAT)	Sem / Div:1/A, B,C, D, E, F	Sub: Calculus and Differential Equations	S Code: 21MAT11
Date: 11/01/22	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	Prove with usual notations, $\tan \phi = r \dfrac{d\theta}{dr}$	6	L1	CO1
b	Find the angle between the two curves $r^2 \sin 2\theta = 4$ and $r^2 = 16 \sin 2\theta$	7	L1	CO1
c	Find the Pedal equation for the curve $\dfrac{l}{r} = 1 + e\cos\theta$	7	L2	CO1
	OR			
2 a	Show that the two curves $r^n = a^n \cos n\theta$ and $r^n = b^n \sin n\theta$ are orthogonal to each other	6	L2	CO1
b	Find the angle between the two curves $r = a \log\theta$ and $r = \dfrac{a}{\log\theta}$	7	L1	CO1
c	Find the Pedal equation for the curve $r^m = a^m(\cos m\theta + \sin m\theta)$	7	L1	CO1
	PART B			
3 a	Find the radius of curvature at any point on the curve $x = a\log(\sec t + \tan t), y = a\sec t$	6	L2	CO1

b	Show that the radius of curvature at any point of the cardiode $r=a(1-\cos\theta)$ varies as $\sqrt{r}$	7	L2	CO1
c	Find the radius of curvature at the point $\left(\dfrac{3a}{2}, \dfrac{3a}{2}\right)$ for the curve $x^3+y^3=3axy$	7	L2	CO1
	OR			
4 a	Find the radius of curvature at any point θ on the cycloid $x=a(\theta+\sin\theta), y=a(1-\cos\theta)$	6	L2	CO1
b	Find the radius of curvature at any point for the polar curve $r^n=a^n \sin n\theta$	7	L2	CO1
c	Prove that for the parabola $y^2=4ax$, the square of the radius of curvature at any point varies as the cube of the focal distance of the point.	7	L2	CO1

MRPai
04|01|22
Prepared by: Prof. Madhavi R Pai

04|01|22
HOD: Prof. M Ramananda Kamath