Name of Examination		**Continuous Assessment Test** – **II** (Dec. 2021)			
Slot: B1+TB1		Course Mode: CBL		**Class Number (s):** VL2021220106144	
Course Code:	BMAT101L	Course Title:	Calculus		
Emp. No.:	13281	Faculty Name:	R.Tamizharasi		School: SAS
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*General Instructions (if any):***1. OPEN BOOK Examinations, 2. ….**

Q. No.	Sub-division	Question Text	Marks	Unit / Module No.	HOTS? (Y/N)	Difficulty Level E/A/T	CO	
Answer all questions			Total Marks: 30					
1.	a)	(i) Expand $e^{ax}\cos by$ in Taylor's series as far as the second degree terms about the origin. (ii) Investigate the maxima and minima, if any, of the function $y^2 + 4xy + 3x^2 + x^3$. (5M+5M)	10					L3
		(OR)						
	b)	(i) Expand $(1 + x + y)^{\frac{1}{2}}$ in Taylor's series as far as the second degree terms about the point $(1, 0)$. (ii) Investigate the maxima and minima, if any, of the function $x^2 y + xy^2 - axy$. (5M+5M)	10	**III**	N	Easy (E)		L3
		(OR)						
	c)	(i) Expand $e^x \cos y$ in Taylor's series as far as the second degree terms near the point $\left(1, \dfrac{\pi}{4}\right)$. (ii) Investigate the maxima and minima, if any, of the function $xy + \dfrac{a^3}{x} + \dfrac{b^3}{y}$. (5M+5M)	10				CO2	L3
		(OR)						
	d)	(i) Expand $x^2 - xy + \dfrac{1}{2} y^2 + 3$ in Taylor's series as far as the second degree terms in powers of $(x-3)$ and $(y-2)$. (ii) Investigate the maxima and minima, if any, of the function $xy^2(3x + 6y - 2)$. (5M+5M)	10					L3
2.	a)	Find the greatest distance of the point (3, 4, 12) from the unit sphere whose centre is at origin, using the Lagrange method of constrained maxima and minima.	10	**III**	N	Tough (T)	CO2	L3

		(OR)							
	b)	Find the shortest distance from the point $(1, 2, -1)$ to the sphere $x^2 + y^2 + z^2 = 24$, using the Lagrange method of constrained maxima and minima.	10						L3
		(OR)							
	c)	Using the Lagrange method of constrained maxima and minima, find the largest product of the numbers x, y and z, when $x^2 + y^2 + z^2 = 9$.	10						L3
		(OR)							
	d)	Find the shortest distance from the point $(1, 2, 2)$ to the sphere $x^2 + y^2 + z^2 = 36$, using the Lagrange method of constrained maxima and minima.	10						L3
3.	a)	Compute the volume bounded by the plane $z = 0$, the cylinder $x^2 + y^2 = 1$ and the plane $x + y + z = 5$.	10						L5
		(OR)							
	b)	Compute the volume bounded by the plane $z = 0$, the cylinder $x^2 + y^2 = 4$ and the plane $x + y + z = 5$.	10	IV	N	Average (A)			L5
		(OR)							
	c)	Compute the volume bounded by the plane $z = 0$, the cylinder $x^2 + y^2 = 16$ and the plane $x + y + z = 5$.	10				CO3		L5
		(OR)							
	d)	Compute the volume bounded by the plane $z = 0$, the cylinder $x^2 + y^2 = 9$ and the plane $x + y + z = 5$.	10						L5

Signature with date