OF ENGINEE

REG

NAME Sri Ka

COURSE Adva

18-03-24

CO1	Apply ... problems in Science and Engineering		3	3
CO2	Analyze vector differentiation and vector integration and related Theorems.	4	3	3
CO3	Apply Laplace Transforms techniques in solving Engineering problems.	4	3	3
CO4	Extend their knowledge apply multiple integrals in solving problems in Science and Engineering. Of the Fundamentals of analytic functions.	4	3	3
CO5	Utilize Complex Integrals and Power series in solving Engineering problems.	4	3	3

Part-A

Answer ALL the questions (4X1 = 4Marks)

Q. No	Questions	Marks	BL	CO	PO
1	If $\phi(x,y,z)$ be a scalar point function, then (a) curl(grad ϕ) = 0 (b) div(grad ϕ) = 0 (c) grad ϕ = 0 (d) $\vec{F}$ = grad ϕ	1	1	2	1,2
2	If $\vec{r}$ be the position vector of any point (x, y, z) with respect to origin then (a) curl $\vec{r}=1$ (b) div $\vec{r}=1$ (c) curl $\vec{r}=3$ (d) div $\vec{r}=3$	1	1	2	1,2
3	$L\left[e^{-t}\sin 3t\right]=$ (a) $\frac{3}{s^2+9}$ (b) $\frac{s}{s^2+9}$ (c) $\frac{3}{(s+1)^2+9}$ (d) $\frac{3}{(s-1)^2+9}$	1	2	3	1,2
4	$L^{-1}\left\{\frac{s}{s^2+16}\right\}=$ (a) $\cos t$ (b) $\sin 4t$ (c) $\sin 2t$ (d) $\cos 4t$	1	2	3	1,2

Part-B

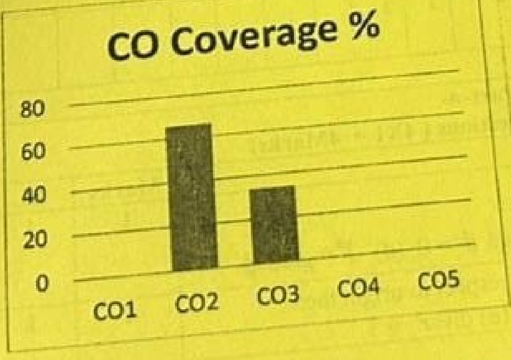
Answer ANY TWO questions (2X8 = 16 Marks)

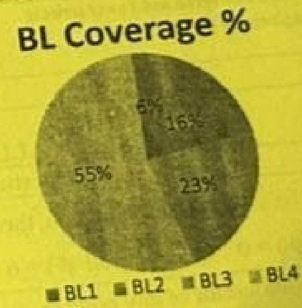
Q. No	Questions	Marks	BL	CO	PO
5	(i) Find the directional derivative of $f(x,y,z)=x^2yz+xy^2z+xyz^2$ at the point (1, -1, 2) in the direction of the vector $2\vec{i}-3\vec{j}+2\vec{k}$.	4	3	2	1,2
	(ii) Prove that $\vec{F}=(2x+yz)\vec{i}+(4y+xz)\vec{j}+(-6z+xy)\vec{k}$ is solenoidal and irrotational.	4	3	2	1,2
6	(i) Find a unit vector normal to the surface $x^2+y^2-z=10$ at (1, 1, 1).	4	3	2	1,2
	(ii) Find the angle between the surfaces $x^2+y^2+z^2=9$ and $x^2+y^2-z=3$ at the point (2, -1, 2).	4	3	2	1,2

Lakshya

7	(i) Find $L\{t\sin 4t\}$.	4	3	3	1,2
	(ii) Find $L^{-1}\left\{\dfrac{s-3}{s^2+4s+13}\right\}$	4	3	3	1,2
	Part-C **Answer ANY TWO questions (2X15 = 30 Marks)**				
8	Verify Stoke's theorem for $\vec{F}=\left(x^2-y^2\right)\vec{i}+2xy\vec{j}$ for the rectangular region in the xy plane bounded by the lines $x=0, x=2, y=0$ and $y=3$.	15	4	2	1,2
9	Verify Gauss divergence theorem for $\vec{F}=\left(x^2-yz\right)\vec{i}+\left(y^2-xz\right)\vec{j}+\left(z^2-xy\right)\vec{k}$ taken over the rectangular parallelepiped $0\le x\le 2, 0\le y\le 4$, and $0\le z\le 6$.	15	4	2	1,2
10	(i) Using convolution theorem evaluate $L^{-1}\left\{\dfrac{1}{s^2(s+3)}\right\}$.	10	4	3	1,2
	(ii) Verify the final value theorem for the function $f(t)=1+e^{-t}(\sin t+\cos t)$.	5	3	3	1,2

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions





Approved by the Audit Professor/Course Coordinator

Evaluation Sheet

Q. No	CO	Max. Marks	Marks Obtained	Total
1	2	1		
2	2	1		
3	3	1		

Name of the Student:

Register No.:

Part-A

Answer ALL the questions (4X1 = 4Marks)

Q. No	Questions	Marks	BL	CO	PO
1	If $\phi(x,y,z)=c$ be a scalar point function, then the unit normal to this surface is (a) $\nabla\phi$ (b) $\nabla\cdot\phi$ (c) $\nabla\times\phi$ (d) $\nabla\phi/\lvert\nabla\phi\rvert$	1	1	2	1,
2	The angle between two surfaces $\phi_1(x,y,z)=c_1$ and $\phi_2(x,y,z)=c_2$ is (a) $\cos^{-1}\left(\frac{\nabla\phi_1\cdot\nabla\phi_2}{\lvert\nabla\phi_1\rvert\lvert\nabla\phi_2\rvert}\right)$ (b) $\sin^{-1}\left(\frac{\nabla\phi_1\cdot\nabla\phi_2}{\lvert\nabla\phi_1\rvert\lvert\nabla\phi_2\rvert}\right)$ (c) $\tan^{-1}\left(\frac{\nabla\phi_1\cdot\nabla\phi_2}{\lvert\nabla\phi_1\rvert\lvert\nabla\phi_2\rvert}\right)$ (d) $\cot^{-1}\left(\frac{\nabla\phi_1\cdot\nabla\phi_2}{\lvert\nabla\phi_1\rvert\lvert\nabla\phi_2\rvert}\right)$	1	1	2	
3	$L\{t^3e^{-2t}\}=$ (a) $\frac{6}{s^4}$ (b) $\frac{6}{s^4+2}$ (c) $\frac{6}{(s-2)^4}$ (d) $\frac{6}{(s+2)^4}$	1	2	3	
4	$L^{-1}\left\{\frac{1}{s^2+25}\right\}=$ (a) $\cos 5t$ (b) $\sin 5t/5$ (c) $\sin 5t$ (d) $\cos 5t/5$	1	2	3	

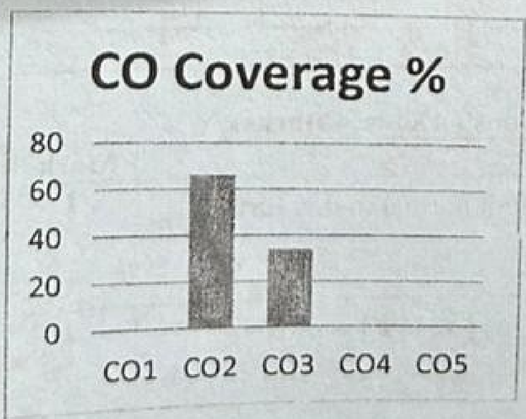
Part-B

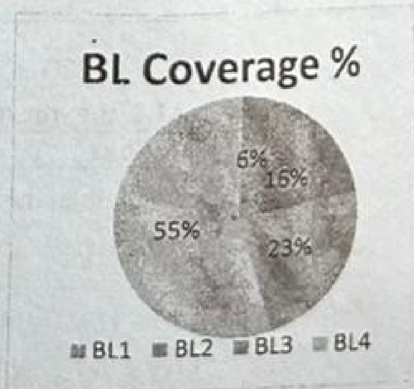
Answer ANY TWO questions (2X8 = 16 Marks)

5	(i) Find the directional derivative of $f(x,y,z)=3x^2y-4xy^2z+5yz^2$ at the point (1, 1, 0) in the direction of the vector $\vec{i}+3\vec{j}-3\vec{k}$. (ii) Find the divergence and curl of the vector point function	4	3	2	

	$\vec{F}=\left(x-x^2yz\right)\vec{i}+\left(y-xy^2z\right)\vec{j}+\left(z-xyz^2\right)\vec{k}$ at a point (1, 1, 1).	4	3	2
6	Show that $\vec{F}=\left(y+z\right)\vec{i}+\left(x+z\right)\vec{j}+\left(x+y\right)\vec{k}$ is irrotational such that $\vec{F}=\nabla\phi$ and hence calculate the scalar potential.	8	3	2
7	(i) Find $L\left\{\frac{\cos at-\cos bt}{t}\right\}$.	4	3	3
	(ii) Verify the initial value theorem for the function $f(t)=3-2\cos t$.	4	3	3
	Part-C **Answer ANY TWO questions (2X15 = 30 Marks)**			
8	Verify Green's theorem in the plane for $\oint_C\left(\left[3x^2-8y^3\right]dx+\left[4y-6xy\right]dy\right)$, C is the closed curve of the region bounded by $x=0, y=0$, and $x+y=1$.	15	4	2
9	Verify Gauss divergence theorem for $\vec{F}=4xz\vec{i}-y^2\vec{j}+yz\vec{k}$ taken over the cube bounded by the planes $x=0, x=3, y=0, y=3, z=0$ and $z=3$.	15	4	2
10	(i) Using convolution theorem evaluate $L^{-1}\left\{\frac{1}{\left(s^2+1\right)^2}\right\}$.	10	4	3
	(ii) Find $L^{-1}\left\{\frac{1}{s(s+1)(s+2)}\right\}$.	5	3	3

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions





Approved by the Audit Professor/Course Coordinator

Name of the Student:

Register No.:

Consolidated Marks:

Evaluation Sheet

Q. No	CO	Max. Marks	Marks Obtained
1	2	1	
2	2	1	
3	3	1	
4	3	1	
5	2	8	

SRM Institute of Science and Technology
College of Engineering and Technology
DEPARTMENT OF MATHEMATICS
SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu
Academic Year: 2023-24 (EVEN)

Slot B1
Set A

Internal Assessment: FT III
Course Code & Title: 21MAB102T- Advanced Calculus and Complex Analysis
Year & Sem: I & II

Date: 18.03.2024
Duration: 2 periods
Max. Marks: 50

Course Articulation Matrix

At the end of this course, learners will be able to:			Program Outcomes (PO)											
Course Outcomes (CO)		Learning Bloom's Level	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Apply multiple integrals in solving problems in Science and Engineering	4	3	3										
CO2	Analyze vector differentiation and vector integration and related Theorems	4	3	3										
CO3	Apply Laplace Transforms techniques in solving Engineering problems	4	3	3										
CO4	Extend their knowledge in Fundamentals of analytic functions	4	3	3										
CO5	Utilize Complex integrals and Power series in solving Engineering problems	4	3	3										

Part- A (4 * 1= 4 Marks)
Answer all the question

Q. No	Questions	Marks	BL	CO	PO
1	The value of $\nabla^2 u$ for $u = x^2 - y^2 + 4z$ is (a) 0 (b) 1 (c) 3 (d) 4	1	1	2	2
2	The value of $\nabla.\bar{F}$ for $\bar{F} = (x+3y)\bar{i} + (y-3z)\bar{j} + (x-2z)\bar{k}$ is (a) 0 (b) 1 (c) 3 (d) 4	1	1	2	2
3	The value of $L[e^{0t}]$ is (a) 4/s (b) 3/s (c) 1/s (d) s	1	1	3	2
4	The value of $L[t^n]$,when n is an integer is (a) $\frac{n!}{s^{n+1}}$ (b) $\frac{(n-1)!}{s^{n+1}}$ (c) 1/s (d) s	1	1	3	2

Part- B (2 * 8= 16 Marks)
Answer any 2 questions

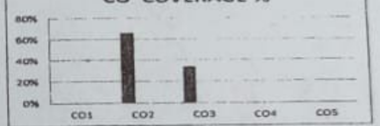
Q. No		Questions	Marks	BL	CO	PO
5		Show that the vector field $\bar{F}$ given by $\bar{F} = (x^2 - yz)\bar{i} + (y^2 - zx)\bar{j} + (z^2 - xy)\bar{k}$ is irrotational such that $\bar{F} = \nabla\varphi$ and hence find the scalar potential φ	8	1	2	2
6	(i)	Find the angle between the surfaces $z = x^2 + y^2 - 3$ and $x^2 + y^2 + z^2 = 9$ at the point (2,-1,2)	4	1	2	2
	(ii)	Find the unit normal to the surface $x^2 + 2y^2 + z^2 = 7$ at the point (1,-1,2)	4	1	2	2
7	(i)	Find $L[\frac{e^{-t} - e^{-3t}}{t}]$	4	1	3	2
	(ii)	Find $L^{-1}[\frac{1}{s(s^2+2s+2)}]$	4	1	3	2

Part- C (2 * 15= 30 Marks)
Answer any 2 questions

Q. No		Questions	Marks	BL	CO	PO
8		Verify Stokes theorem for $\bar{F} = (y - z + 2)\bar{i} + (yz + 4)\bar{j} - (xz)\bar{k}$ where S is the surface of a cube x=0,y=0,z=0,x=2,y=2,z=2 above the XOY plane	15	2	2	2
9		Verify Green's theorem in the plane for $\oint_C (xy + y^2)dx + x^2 dy$ where C is the closed curve of the region bounded by $y = x$ and $y = x^2$	15	2	2	2
10	(i)	Find $L^{-1}[\frac{s}{(s^2+1)(s^2+4)}]$ using convolution theorem	10	1	3	2
	(ii)	Verify initial value theorem for the function $f(t) = 1 + e^{-t}(\sin t + \cos t)$	5	1	3	2

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions

CO COVERAGE %



BL COVERAGE %

Approved by the Audit Professor/Course Coordinator

Evaluation Sheet

Name of the Student:
Register No.:

Q. No	CO	Marks Obtained	Total
Part- A (4 * 1= 4 Marks)			
1	2		
2	2		
3	3		
4	3		
Part B(2 * 8=16)			
5	2		
6	2		
	2		
7	3		
	3		
Part B(2 * 15=30)			
8	2		
9	2		
10	3		
	3		

Consolidated Marks:

CO	Marks Scored
CO2	
CO3	
Total	

Signature of the Course Teacher

SRM

SRM Institute of Science and Technology
College of Engineering and Technology
DEPARTMENT OF MATHEMATICS
SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu
Academic Year: 2023-24 (EVEN)

Slot B1
Set B

Internal Assessment: FT3
Course Code & Title: 21MAB102T- Advanced Calculus and Complex Analysis
Year & Sem: I & II

Date: 18.03.2024
Duration: 2 Periods
Max. Marks: 50

Course Articulation Matrix

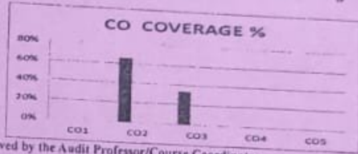
At the end of this course, learners will be able to:			Program Outcomes (PO)											
Course Outcomes (CO)		Learning Bloom's Level	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Apply multiple integrals in solving problems in Science and Engineering	4	3	3										
CO2	Analyze vector differentiation and vector integration and related Theorems	4	3	3										
CO3	Apply Laplace Transforms techniques in solving Engineering problems	4	3	3										
CO4	Extend their knowledge in Fundamentals of analytic functions	4	3	3										
CO5	Utilize Complex integrals and Power series in solving Engineering problems	4	3	3										

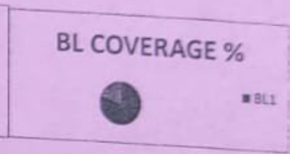
Q. No	Part A (4 * 1 = 4 Marks) Answer all Questions	Marks	BL	CO	PO
1	The value of $curl\, \vec{F}$ for $\vec{F} = xy\vec{i} + yz\vec{j} + zx\vec{k}$ is (a) $x\vec{i} + z\vec{j} + y\vec{k}$ (b) $y\vec{i} - z\vec{j} - x\vec{k}$ (c) $-y\vec{i} - z\vec{j} - x\vec{k}$ (d) $-x\vec{i} - y\vec{j} - z\vec{k}$	1	1	2	2
2	If the vector $\vec{v} = (x+3y)\vec{i} + (y-2z)\vec{j} + (x+az)\vec{k}$ is solenoidal, then the value of the constant 'a' is (a) 2 (b) −2 (c) 1 (d) 4	1	1	2	2
3	$L[5t^2] =$ (a) $\frac{2}{s^3}$ (b) $\frac{2}{s^2}$ (c) $\frac{10}{s^3}$ (d) $\frac{10}{s^2}$	1	1	3	2
4	The value of $L^{-1}\left[\frac{3}{s-1}\right]$ is (a) $3e^t$ (b) $3e^{-t}$ (c) e^t (d) e^{-t}	1	1	3	2

Q. No	Part- B (2 * 8= 16 Marks) Answer any two questions Questions	Marks	BL	CO	PO
5	Find the total work done in moving a particle in a force field given by $\vec{F} = 3xy\vec{i} - 5z\vec{j} + 10x\vec{k}$ along the curve $x = t^2 + 1, y = 2t^2, z = t^3$ from $t = 1$ to $t = 2$.	8	1	2	2
6	(i) Find the angle between the surfaces $x^2 + yz = 2$ and $x + 2y - z = 2$ at (1,1,1).	4	1	2	2
	(ii) Find the unit normal vector to the level surface $x^2y + 2xz = 4$ at the point $(2,-2,3)$	4	1	2	2
7	(i) Find the Laplace transform of $\frac{\sin t}{t}$.	4	1	3	2
	(ii) Find $L^{-1}\left[\frac{s}{s^2+4s+5}\right]$	4	1	3	2

	Part- C (2 * 15= 30 Marks) Answer any two questions				
8	Verify Stoke's theorem for $\vec{F} = (x^2 + y^2)\vec{i} - 2xy\vec{j}$ taken around the rectangle bounded by the lines $x = \pm a, y = 0$ and $y = b$.	15	2	2	2
9	Verify Gauss Divergence theorem for the function $\vec{F} = 4xz\vec{i} - y^2\vec{j} + yz\vec{k}$ taken over the cube bounded by the planes $x = 0, x = 2, y = 0, y = 2, z = 0$ and $z = 2$.	15	2	2	2
10	(i) Find $L^{-1}\left[\frac{1}{(s^2+a^2)^2}\right]$ using convolution theorem.	10	1	3	2
	(ii) Evaluate $\int_0^\infty te^{-2t}\sin t\, dt$ using Laplace transform.	5	2	3	2

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions





Approved by the Audit Professor/Course Coordinator

Evaluation Sheet

Name of the Student:
Register No.:

Part- A (4 * 1= 4 Marks)			
Q. No	CO	Marks Obtained	Total
1	1		
2	1		
3	1		
4	1		
Part B(2 * 8=16)			
5	2		
6	2		
	2		
7	3		
	3		
Part B(2 * 15=30)			
8	2		
9	2		
10	3		
	3		

Consolidated Marks:

CO	Marks Scored
CO2	
CO3	
Total	

Signature of the Course Teacher

Part- A (2 * 8= 16 Marks)

Answer any 2 questions

Q. No	Questions	Marks	BL	CO	PO
1	Change the order of integration in $\int_0^{4a}\int_{\frac{x^2}{4a}}^{2\sqrt{ax}} xydydx$ and hence evaluate it.	8	3	1	2
2	Evaluate $\iint r^3\, dr\, d\theta$, over the area bounded between the circles $r = 2\cos\theta$ and $r = 4\cos\theta$.	8	3	1	2
3	Evaluate $\iint xydxdy$ over the positive quadrant of the circle $x^2 + y^2 = 1$.	8	3	1	2
	Part- B (1 * 14= 14 Marks)				
4	(i) Evaluate $\int_0^1\int_{y^2}^1\int_0^{1-x} x\, dx\, dy\, dz$.	7	4	1	2

(ii)	Find the area of the ellipse $\frac{x^2}{a^2}+\frac{y^2}{b^2}=1$ using double integration.	7	4	1	2

...l (BL) *Coverage in Questions*

BL Coverage%

SRM INSTITUTE OF SCIENCE & TECHNOLOGY
Deemed to be University u/s 3 of UGC Act, 1956

SRM Institute of Science and Technology
College of Engineering and Technology
DEPARTMENT OF MATHEMATICS
SRM Nagar, Kattankulathur 603203, Chengalpattu District, Tamilnadu
Academic Year: 2023-2024 (EVEN)

Slot D2
Set A

Internal Assessment: CLA1 T1
Course Code & Title: 21MAB102T - Advanced Calculus and Complex Analysis
Year & Sem: I & II

Date: 21.02.2024
Duration: 1 hour 10 minutes
Max. Marks: 30

Course Articulation Matrix

At the end of this course, learners will be able to:			Program Outcomes (PO)											
Course Outcomes (CO)		Learning Bloom's Level	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Apply multiple integrals in solving problems in Science and Engineering.	4	3	3										
CO2	Analyze vector differentiation and vector integration and related Theorems	4	3	3										
CO3	Apply Laplace Transforms techniques in solving Engineering problems	4	3	3										
CO4	Extend their knowledge in Fundamentals of analytic functions	4	3	3										
CO5	Utilize Complex integrals and Power series in solving Engineering problems	4	3	3										

Part - A (2*8 = 16 Marks)
Answer any 2 questions

Q. No.	Questions	Marks	BL	CO	PO
1.	Change the order of integration in $\int_0^a \int_{a-y}^{\sqrt{a^2-y^2}} y\,dy\,dx$ and hence evaluate it.	8	3	1	2
2.	Evaluate $\iint_R xy\,dx\,dy$, where R is the region bounded by the parabola $y^2 = x$, the $x-$axis and the line $x + y = 2$, lying on the first quadrant.	8	3	1	2
3.	Evaluate $\iint_A r\sin\theta\,dr\,d\theta$ over the area of the cardioid $r = a(1+\cos\theta)$ above the initial line.	8	3	1	2

PART - B (1*14 = 14 Marks)

Q. No.	Questions	Marks	BL	CO	PO
4.	(i) Find the smaller of the area bounded by $y = 2 - x$ and $x^2 + y^2 = 4$ using double integral.	7	4	1	2
	(ii) Evaluate $\int_0^a \int_0^{b(1-\frac{x}{a})} \int_0^{c(1-\frac{x}{a}-\frac{y}{b})} dx\,dy\,dz$.	7	4	1	2

SRM

INSTITUTE OF SCIENCE & TECHNOLOGY

Deemed to be University u/s 3 of UGC Act, 1956

SRM Institute of Science and Technology
College of Engineering and Technology
DEPARTMENT OF MATHEMATICS
SRM Nagar, Kattankulathur 603203, Chengalpattu District, Tamilnadu
Academic Year: 2023-2024 (EVEN)

Slot D2
Set B

Internal Assessment: CLA1 T1
Course Code & Title: 21MAB102T - Advanced Calculus and Complex Analysis
Year & Sem: I & II

Date: 21.02.2024
Duration: 1 hour 10 minutes
Max. Marks: 30

Course Articulation Matrix

At the end of this course, learners will be able to:			Program Outcomes (PO)											
Course Outcomes (CO)		Learning Bloom's Level	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Apply multiple integrals in solving problems in Science and Engineering.	4	3	3										
CO2	Analyze vector differentiation and vector integration and related Theorems	4	3	3										
CO3	Apply Laplace Transforms techniques in solving Engineering problems	4	3	3										
CO4	Extend their knowledge in Fundamentals of analytic functions	4	3	3										
CO5	Utilize Complex integrals and Power series in solving Engineering problems	4	3	3										

Q. No.	Questions	Marks	BL	CO	PO
	Part - A (2*8 = 16 Marks) **Answer any 2 questions**				
1.	Change the order of integration in $\int_0^3\int_1^{\sqrt{4-y}}(x+y)\,dx\,dy$ and hence evaluate it.	8	3	1	2
2.	Using double integral find the area enclosed by the curves $y=2x^2$ and $y^2=4x$.	8	3	1	2
3.	Evaluate the double integral $\int_0^{\frac{\pi}{3}}\int_0^{a\sin 3\theta} r\,dr\,d\theta$.	8	3	1	2
	PART - B (1*14 = 14 Marks)				
4.	(i) Evaluate $\int_0^1\int_0^{\sqrt{1+x^2}}\frac{dy\,dx}{1+x^2+y^2}$.	7	4	1	2
	(ii) Evaluate $\int_0^a\int_0^{\sqrt{a^2-x^2}}\int_0^{\sqrt{a^2-x^2-y^2}}\frac{dz\,dy\,dx}{\sqrt{a^2-x^2-y^2-z^2}}$.	7	4	1	2

SRM Institute of Science and Technology
College of Engineering and Technology
DEPARTMENT OF MATHEMATICS
SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu
Academic Year: 2023-24 (EVEN)

Slot B2
Set B

Internal Assessment: CLA1 T1
Course Code & Title: 21MAB102T- Advanced Calculus and Complex Analysis
Year & Sem: I & II

Date: 19.02.2024
Duration: 1 hour 10 minutes
Max. Marks: 30

Course Articulation Matrix

At the end of this course, learners will be able to:			Program Outcomes (PO)											
Course Outcomes (CO)		Learning Bloom's Level	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Apply multiple integrals in solving problems in Science and Engineering.	4	3	3										
CO2	Analyze vector differentiation and vector integration and related Theorems	4	3	3										
CO3	Apply Laplace Transforms techniques in solving Engineering problems	4	3	3										
CO4	Extend their knowledge in Fundamentals of analytic functions	4	3	3										
CO5	Utilize Complex integrals and Power series in solving Engineering problems	4	3	3										

Part- A (2 * 8= 16 Marks)
Answer any 2 questions

Q. No	Questions	Marks	BL	CO	PO
1	Change the order of integration in $\int_0^a \int_x^a (x^2+y^2)\, dy\, dx$ and hence evaluate it.	8	3	1	2
2	Find the area bounded by the circles $r = 2\sin\theta$ and $r = 4\sin\theta$.	8	3	1	2
3	Evaluate $\iint_R (4-x^2-y^2)\, dx\, dy$ where R is the region bounded by the lines $x=0$, $x=1$, $y=0$ and $y=3$.	8	3	1	2

Part- B (1 * 14= 14 Marks)

Q. No	Questions	Marks	BL	CO	PO
4	(i) Evaluate $\int_0^1 \int_0^{1-x} \int_0^{x+y} e^z\, dz\, dy\, dx$.	7	4	1	2
	(ii) Using double integration find the area bounded by $y = x$ and $y = x^2$	7	4	1	2

Slot D2
Set A

SRM Institute of Science and Technology
College of Engineering and Technology
DEPARTMENT OF MATHEMATICS
SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu
Academic Year: 2023-24 (EVEN)

Slot D2
Set B

Test: FT- IV
Course Code & Title: 21MAB102T- Advanced Calculus and Complex Analysis
Year & Sem: I &II

Date: 25.04.2024
Duration: 2 Periods
Max. Marks: 50

Course Articulation Matrix

At the end of this course, learners will be able to:			Program Outcomes (PO)											
Course Outcomes (CO)		Learning Bloom's Level	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Apply multiple integrals in solving problems in Science and Engineering.	4	3	3										
CO2	Analyze vector differentiation and vector integration and related Theorems.	4	3	3										
CO3	Apply Laplace Transforms techniques in solving Engineering problems.	4	3	3										
CO4	Extend their knowledge of the Fundamentals of analytic functions	4	3	3										
CO5	Utilize Complex Integrals and Power series in solving Engineering problems.	4	3	3										

Part-A
Answer ALL the questions (4X1 = 4 Marks)

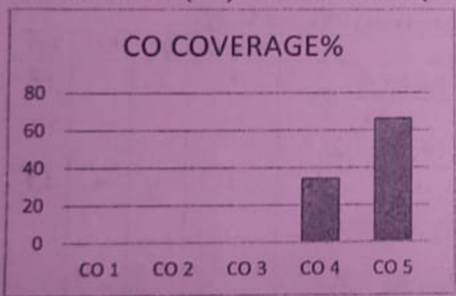
Q. No	Questions	Marks	BL	CO	PO
1	The invariant points of the transformation $w=\dfrac{2z+4i}{iz+1}$ are (a) $z=4i,-i$ (b) $z=-4i,i$ (c) $z=2i,i$ (d) $z=-2i,i$	1	2	4	1,2
2	The necessary condition for f(z) to be analytic is (a) $u_x=v_y,\ u_y=-v_x$ (b) $u_x=v_y,\ u_y=v_x$ (c) $u_x=v_y,\ u_y=-v_{xx}$ (d) $u_x=v_{yy},\ u_y=v_x$	1	1	4	1,2
3	If f(z) is analytic inside and on C , the value of $\int_C \dfrac{f(z)}{z-a}dz$, where C is the simple closed curve and 'a' is any point inside C is (a) f(a) (b) $2\pi i f(a)$ (c) $\pi i f(a)$ (d) 0	1	1	5	1,2
4	The poles of $f(z)=\dfrac{1}{(z-5)^3}$ are (a) z = 5 is a pole of order 5 (b) z = 5 is a simple pole (c) z = 3 is a pole of order 3 (d) z = 5 is a pole of order 3	1	2	5	1,2

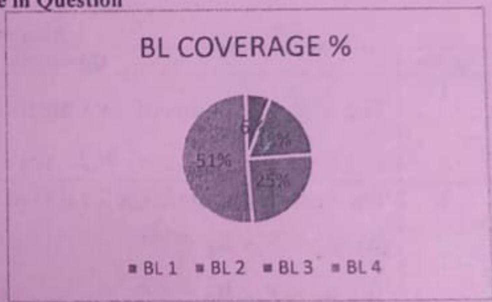
Part-B
Answer ANY TWO questions (2 x 8 = 16 Marks)

Q. No	Questions	Marks	BL	CO	PO
5	Find the analytic function f(z) whose real part is given by $u=x^3-3xy^2+3x^2-3y^2+1$ using Milne Thomson method.	8	4	4	1,2
6	Evaluate $\int_C \dfrac{4-3z}{z(z-1)(z-2)}\,dz$ where C is a circle $\lvert z\rvert=\dfrac{3}{2}$ by using Cauchy's integral formula.	8	3	5	1,2
7	Expand $f(z)=\dfrac{1}{(z-1)(z-2)}$ in Laurent's series valid for the region (i) $1<\lvert z\rvert<2$ (ii) $\lvert z\rvert>2$	8	2	5	1,2

Part-C **Answer ANY TWO questions (2 x 15 = 30 Marks)**					
8	(i) Find the bilinear transformation which maps the points $z = 1, i, -1$ into the points $w = 0, 1, \infty$. (ii) What is the region of the w-plane into which the rectangular region in the z-plane bounded by the lines $x = 0, y = 0, x = 1, y = 2$ is mapped under the transformation $w = z + 2 - i$.	10+5	3	4	1,2
9	(i) Evaluate $\int_C \frac{\sin \pi z + \cos \pi z^2}{z(z+1)} dz$ where C is a circle $\lvert z \rvert = 2$ by using Cauchy's residue theorem. (ii) Expand $f(z) = \cos z$ about the point $z = \frac{\pi}{4}$ as a Taylor's series.	10+5	4	5	1,2
10	Evaluate $\int_0^{2\pi} \frac{d\theta}{5 - \sin\theta}$ using contour integration.	15	4	5	1,2

Course Outcome (CO) and Bloom's level (BL) Coverage in Question





Approved by the Audit Professor/Course Coordinator

Evaluation Sheet

Name of the Student:

Register No.:

Q. No	CO	Max. Marks	Marks Obtained	Total
1	4	1		
2	4	1		
3	5	1		
4	5	1		
5	4	8		
6	5	8		
7	5	8		
8	4	10+5		
9	5	10+5		
10	5	15		

Consolidated Marks:

CO	Marks Scored
CO4	
CO5	
Total	

Signature of Course teacher

SRM Institute of Science and Technology
College of Engineering and Technology
DEPARTMENT OF MATHEMATICS
SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu
Academic Year: 2023-2024 (EVEN)

Slot D1
Set B

Internal Assessment: FT IV
Course Code & Title: 21MAB102T - Advanced Calculus and Complex Analysis
Year & Sem: I & II

Date: 25.04.2024
Duration: 2 Periods
Max. Marks: 50

Course Articulation Matrix

At the end of this course, learners will be able to:			Program Outcomes (PO)											
Course Outcomes (CO)		Learning Bloom's Level	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Apply multiple integrals in solving problems in Science and Engineering.	4	3	3										
CO2	Analyze vector differentiation and vector integration and related Theorems	4	3	3										
CO3	Apply Laplace Transforms techniques in solving Engineering problems	4	3	3										
CO4	Extend their knowledge in Fundamentals of analytic functions	4	3	3										
CO5	Utilize Complex integrals and Power series in solving Engineering problems	4	3	3										

Part - A (4*1 = 4 Marks)
Answer all the questions

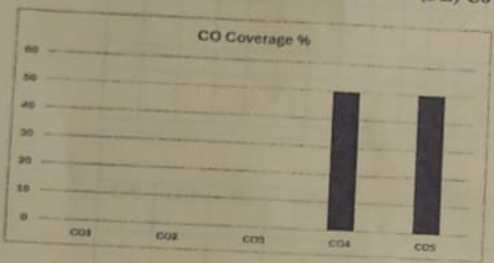
Q. No.	Questions	Marks	BL	CO	PO
1.	The image of the rectangular region in the z-plane bounded by the lines $x=0, y=0, x=2$ and $y=1$ under the transformation $w=2z$ is (a) parabola (b) circle (c) straight line (d) rectangle is magnified twice	1	1	4	2
2.	The invariant point of the transformation $w=\frac{1}{z-2i}$ is (a) $z=i$ (b) $z=-i$ (c) $z=1$ (d) $z=-1$	1	1	4	2
3.	The part $\sum_{n=1}^{\infty} b_n(z-a)^{-n}$ consisting of negative integral powers of $(z-a)$ is called as (a) The analytic part of the Laurent's series (b) The principal part of the Laurent's series (c) The real part of the Laurent's series (d) The imaginary part of the Laurent's series	1	1	5	2
4.	The value of $\oint_C \frac{1}{(3z+1)}dz$ where C is the circle $\lvert z\rvert=1$ is (a) 0 (b) πi (c) $\frac{2\pi}{3}i$ (d) 2	1	1	5	2

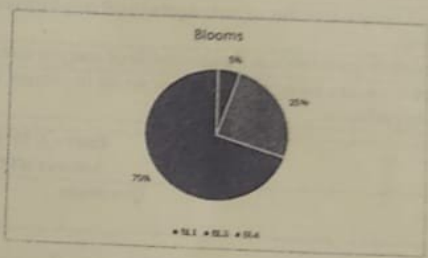
Part - B (2*8 = 16 Marks)
Answer any 2 questions

Q. No.	Questions	Marks	BL	CO	PO
5.	Find the analytic function $f(z)$ whose real part is $u=e^x(x\cos y - y\sin y)$, by Milne-Thompson method.	8	3	4	2
6.	Using Cauchy's integral formula, evaluate $\oint_C \frac{4-3z}{z(z-1)(z-2)}dz$, where $C: \lvert z\rvert = \frac{3}{2}$.	8	3	5	2
7.	Expand $f(z)=\frac{4z}{(z^2-1)(z-4)}$ in Laurent's series for the region $2<\lvert z-1\rvert<3$.	8	3	5	2

	PART - C (2*15 = 30 Marks)				
8.	(a) Find the Bilinear transformation that maps $z = -1, 0, 1$ onto $w = 0, i, 3i$.	10	4	4	2
	(b) Prove that $f(z) = 2xy + i(x^2 - y^2)$ is analytic.	5	4	4	2
9.	(a) Using Cauchy's Residue theorem, evaluate $\oint_C \frac{e^z}{(z+1)(z-1)} dz$, where $C : \lvert z \rvert = 3$.	10	4	5	2
	(b) Find the Taylor's series up to third degree for $f(z) = \sin z$ about $z = \frac{\pi}{4}$	5	4	5	2
10.	Evaluate $\int_0^{2\pi} \frac{d\theta}{5 + 3\cos\theta}$, using contour integration.	15	4	5	2

Course Outcome (CO) and Bloom's level (BL) Coverage in Questions





Approved by the Audit Professor/Course Coordinator

Name of the Student:

Register No.:

PART - A (4*1 = 4 Marks)			
Q. No.	CO	Marks Obtained	Total
1	4		
2	4		
3	5		
4	5		

PART - B (2*8 = 16 Marks)			
Q. No.	CO	Marks Obtained	Total
5	4		
6	5		
7	5		

PART - C (2*15= 30 Marks)			
8.	4		
9.	5		
10.	5		

Consolidated Marks:

CO.	Marks Scored
CO4	
CO5	
Total	

Signature of the Course Teacher

REDMI NOTE 9 PRO
AI QUAD CAMERA

SRM Institute of Science and Technology
College of Engineering and Technology
DEPARTMENT OF MATHEMATICS
SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu
Academic Year: 2023-24 (EVEN)

Slot D2
Set A

Test: FT- IV
Course Code & Title: 21MAB102T- Advanced Calculus and Complex Analysis
Year & Sem: I &II

Date: 25.04.2024
Duration: 2 Periods
Max. Marks: 50

Course Articulation Matrix

At the end of this course, learners will be able to:		Learning Bloom's Level	Program Outcomes (PO)											
Course Outcomes (CO)			1	2	3	4	5	6	7	8	9	10	11	12
CO1	Apply multiple integrals in solving problems in Science and Engineering.	4	3	3										
CO2	Analyze vector differentiation and vector integration and related Theorems.	4	3	3										
CO3	Apply Laplace Transforms techniques in solving Engineering problems.	4	3	3										
CO4	Extend their knowledge of the Fundamentals of analytic function s	4	3	3										
CO5	Utilize Complex Integrals and Power series in solving Engineering problems.	4	3	3										

Part-A
Answer ALL the questions (4x1 = 4 Marks)

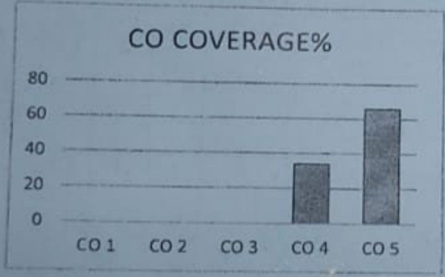
Q. No	Questions	Marks	BL	CO	PO
1	The invariant points of the transformation $w=\frac{1}{z-2i}$ are (a) $z=0,2i$ (b) $z=0,-i$ (c) $z=2i,0$ (d) $z=-2i,2i$	1	2	4	1,2
2	The transformation $w=cz$ where c is real constant known as (a) rotation (b) reflection (c) magnification (d) magnification and rotation	1	1	4	1,2
3	If f(z) is analytic inside and on C , the value of $\int_C \frac{f(z)}{z-a}dz$,where C is the simple closed curve and 'a' is any point outside C is (a) f(a) (b) $2\pi i f(a)$ (c) $\pi i f(a)$ (d) 0	1	1	5	1,2
4	The poles of $f(z)=\frac{1}{(z-10)^5}$ are (a) z = 10 is a pole of order 10 (b) z = 5 is a simple pole (c) z = 5 is a pole of order 10 (d) z =10 is a pole of order 5	1	2	5	1,2

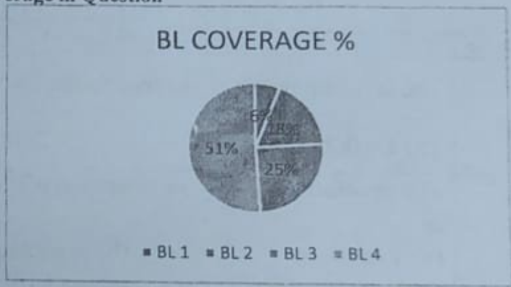
Part-B
Answer ANY TWO questions (2x8 = 16 Marks)

Q. No	Questions	Marks	BL	CO	PO
5	Find the analytic function f(z) whose imaginary part is given by $v=x^3+3x^2y-3xy^2-y^2+4x+5$ using Milne Thomson method.	8	4	4	1,2
6	Evaluate $\int_C \frac{z}{(z-1)(z-2)^2}dz$ where C is a circle $\|z-2\|=\frac{1}{2}$ by using Cauchy's integral formula.	8	3	5	1,2
7	Expand $f(z)=\frac{z+3}{(z+1)(z-2)}$ in Laurent's series valid for the region (i) $1<\|z\|<2$ (ii) $\|z\|>2$	8	3	5	1,2

Part-C Answer ANY TWO questions (2x15 = 30 Marks)					
8	(i) Find the bilinear transformation which maps the points $z=0,-1,i$ into $w=i,0,\infty$. (ii) Prove that $u=\frac{1}{2}\log(x^2+y^2)$ is harmonic.	10+5	3	4	1,2
9	(i) Evaluate $\int_C \frac{\cos \pi z^2}{(z-1)(z-2)}dz$ where C is a circle $\lvert z\rvert=3$ by using Cauchy's residue theorem. (ii) Expand $f(z)=\frac{1}{z-2}$ about the point $z=1$ as a Taylor's series.	10+5	4	5	1,2
10	Evaluate $\int_0^{2\pi} \frac{d\theta}{2+\cos\theta}$ using contour integration.	15	4	5	1,2

Course Outcome (CO) and Bloom's level (BL) Coverage in Question





Approved by the Audit Professor/Course Coordinator

Evaluation Sheet

Name of the Student:

Register No.:

Q. No	CO	Max. Marks	Marks Obtained	Total
1	4	1		
2	4	1		
3	5	1		
4	5	1		
5	4	8		
6	5	8		
7	5	8		
8	4	10+5		
9	5	10+5		
10	5	15		

Consolidated Marks:

CO	Marks Scored
CO4	
CO5	
Total	

Signature of Course teacher

SRM Institute of Science and Technology
College of Engineering and Technology
DEPARTMENT OF MATHEMATICS
SRM Nagar, Kattankulathur 603203, Chengalpattu District, Tamilnadu

Slot D1
Set A

Academic Year: 2023-2024 (EVEN)

Internal Assessment: FT IV
Course Code & Title: 21MAB102T - Advanced Calculus and Complex Analysis
Year & Sem: I & II

Date: 25.04.2024
Duration: 2 Periods
Max. Marks: 50

Course Articulation Matrix

At the end of this course, learners will be able to:			Program Outcomes (PO)											
Course Outcomes (CO)		Bloom's Level	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Apply multiple integrals in solving problems in Science and Engineering.	4	3	3										
CO2	Analyze vector differentiation and vector integration and related Theorems	4	3	3										
CO3	Apply Laplace Transforms techniques in solving Engineering problems	4	3	3										
CO4	Extend their knowledge in Fundamentals of analytic functions	4	3	3										
CO5	Utilize Complex integrals and Power series in solving Engineering problems	4	3	3										

Part - A (4*1 = 4 Marks) - Answer ALL the questions

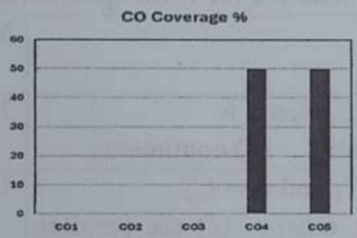
Q. No.	Questions	Marks	BL	CO	PO
1.	If a function $u(x,y)$ satisfies $u_{xx}+u_{yy}=0$, then u is (a) analytic (b) harmonic (c) differentiable (d) continuous	1	1	4	1
2.	If $u+iv$ is analytic, then the curves $u=C_1$ and $v=C_2$ (a) cut orthogonally (b) intersect each other (c) are parallel (d) coincides	1	1	4	1
3.	The value of $\oint_C \frac{1}{2z+1}dz$, where $C:\lvert z\rvert=1$ is (a) 0 (b) π i (c) $\frac{\pi}{2}$ i (d) 2	1	1	5	1
4.	The annular region for the function $f(z)=\frac{1}{z(z-1)}$ is (a) $0<\lvert z\rvert<1$ (b) $0<\lvert z\rvert<2$ (c) $\lvert z\rvert>1$ (d) $\lvert z\rvert<1$	1	1	5	1

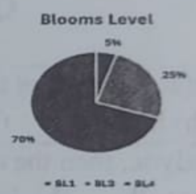
Part - B (2*8 = 16 Marks) - Answer any TWO Questions

Q. No.	Questions	Marks	BL	CO	PO
5.	Using Milne's method, construct an analytic function $f(z)=u+iv$ if $v=(x-y)(x^2+4xy+y^2)$.	8	3	4	2
6.	Using Cauchy's integral formula, evaluate $\oint_C \frac{\cos \pi z^2+\sin \pi z^2}{(z-1)(z-2)}dz$, where $C:\lvert z\rvert=3$.	8	3	5	2
7.	Find the Laurent's expansion of $f(z)=\frac{7z-2}{z(z+1)(z-2)}$ in the region $1<\lvert z+1\rvert<3$.	8	3	5	2

Part - C (2*15 = 30 Marks) - Answer any TWO Questions					
Q. No.	Questions	Marks	BL	CO	PO
8.	(a) Find the Bilinear transformation that maps $z = 1, i, -1$ onto $w = 2, i, -2$.	10	4	4	2
	(b) Determine the region D of the w-plane into which the triangular region D enclosed by the lines $x = 0, y = 0, x+y = 1$ is transformed under the transformation $w = 2z$	5	4	4	2
9.	(a) By Cauchy-Residue theorem, evaluate $\oint_C \frac{2z-1}{z(z+1)(z-3)}dz$, where $C : \|z\| = 2$.	10	4	5	2
	(b) Find Taylor's series for $f(z) = cosz$ about $z = \frac{\pi}{2}$, upto fourth degree.	5	4	5	2
10.	Evaluate $\int_0^{2\pi} \frac{d\theta}{13+5\,sin\theta}$, using contour integration.	15	4	5	2

Course Outcome (CO) and Blooms level (BL) Coverage in Questions





Name of the Student: **Register No.:**

PART - A (4*1 = 4 Marks)				PART - B (2*8 = 16 Marks)			
Q. No.	CO	Marks Obtained	Total	Q. No.	CO	Marks Obtained	Total
1	4			5	4		
2	4			6	5		
3	5			7	5		
4	5						
PART - C (2*15= 30 Marks)							
8.	4						
9.	5						
10.	5						

Consolidated Marks:

CO.	Marks Scored
CO4	
CO5	
Total	

Signature of the Course Teacher

SRM

SRM Institute of Science and Technology
College of Engineering and Technology
Department of Mathematics
SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

Academic Year: 2023-24 (EVEN)

Slot B2
Set A

Test: FT- IV
Course Code &Title: 21MAB102T- Advanced Calculus and Complex Analysis
Year & Sem: I &II
Course Articulation Matrix

Date: 30.04.24
Duration: 2 Periods
Max. Marks: 50

At the end of this course, learners will be able to:			Program Outcomes (PO)											
Course Outcomes (CO)		Learning Bloom's Level	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Apply multiple integrals in solving problems in Science and Engineering.	4	3	3										
CO2	Analyze vector differentiation and vector integration and related Theorems.	4	3	3										
CO3	Apply Laplace Transforms techniques in solving Engineering problems.	4	3	3										
CO4	Extend their knowledge of the Fundamentals of analytic functions	4	3	3										
CO5	Utilize Complex Integrals and Power series in solving Engineering problems.	4	3	3										

Part-A
Answer ALL the questions (4X1 = 4 Marks)

Q. No	Questions	Marks	BL	CO	PO
1	The necessary condition for the function $f(z) = u + iv$ to be analytic is (a) $u_x = v_y\ , u_y = -v_x$ (b) $u_x = -v_y\ , u_y = v_x$ (c) $u_x = v_y\ , u_y = v_x$ (d) $u_y = v_y\ , u_x = v_x$	1	1	4	1,2
2	The real part u of an analytic function $f(z) = u + iv$ is (a) analytic (b) harmonic (c) discontinuous (d) not analytic	1	1	4	1,2
3	The value of $\int_C \frac{z}{(z-1)}\, dz$ where C is the circle $\lvert z\rvert = 2$ is (a) πi (b) $2\pi i$ (c) $4\pi i$ (d) 0	1	2	5	1,2
4	In the Laurent's series, the part $\sum_1^\infty b_n(z-a)^{-n}$, consisting of negative integral powers of $(z-a)$, is called the (a) analytic part (b) principal part (c) harmonic (d) conjugate	1	1	5	1,2

Part-B
Answer ANY TWO questions (2X8 = 16 Marks)

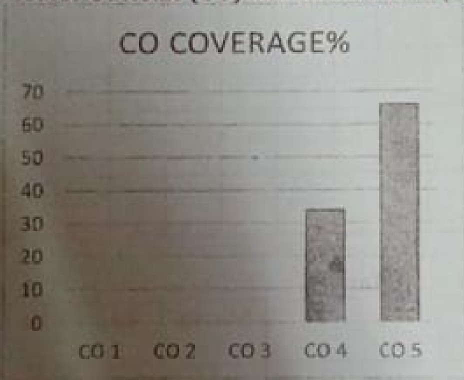
Q. No	Questions	Marks	BL	CO	PO
5	Obtain the analytic function $f(z) = u + iv$ if the imaginary part is given as $v = -2Sinx(e^y - e^{-y})$ using Milne Thomson Method.	8	3	4	1,2
6	Evaluate $\oint_C \frac{z-2}{z(z-1)}\, dz$ where C is $\lvert z\rvert = 3$ using Cauchy Integral Formula.	8	3	5	1,2
7	Expand $f(z) = \frac{1}{(z+1)(z+2)}$ as a Laurent series in the region (i) $1 < \lvert z\rvert < 2$ (ii) $\lvert z\rvert > 2$.	8	4	5	1,2

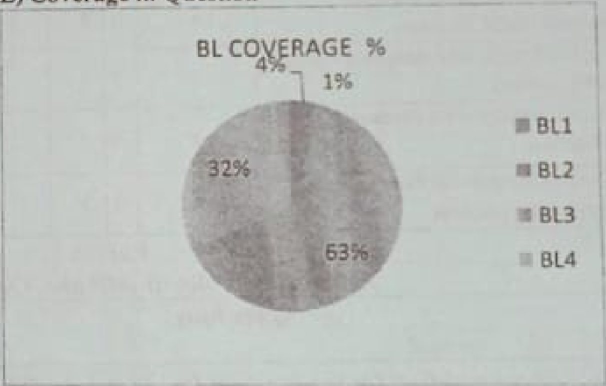
Part-C

Answer ANY TWO questions (2X15 = 30 Marks)

8 (i)	Find the bilinear transformation which maps the points $z_1 = 1,\ z_2 = i$ and $z_3 = -1$ into the points $w_1 = i, w_2 = 0$ and $w_3 = -i$.	10+5	3	4	1,2
(ii)	Find the image of the rectangular region in the z-plane bounded by the lines $x = 0, y = 0, x = 2$ and $y = 1$ under the transformation $w = 2z$.				
9(i)	Evaluate $\oint_C \frac{z^2}{(z-1)(z+1)} dz$ where C is a circle $\lvert z \rvert = 2$ by using Cauchy's Residue theorem.	10+5	4	5	1,2
(ii)	Obtain the Taylor's series to represent the function $f(z) = \frac{1}{z}$ at the point $z = 2$ upto fourth degree term.				
10	Evaluate $\int_0^{2\pi} \frac{d\theta}{5+4\sin\theta}$ by using Contour Integration.	15	3	5	1,2

Course Outcome (CO) and Bloom's level (BL) Coverage in Question





Approved by the Audit Professor/Course Coordinator

Evaluation Sheet

Name of the Student:

Register No.:

Q. No	CO	Max. Marks	Marks Obtained	Total
1	4	1		
2	4	1		
3	5	1		
4	5	1		
5	4	8		
6	5	8		
7	5	8		
8	4	15		
9	5	15		
10	5	15		

Consolidated Marks:

CO	Marks Scored
CO4	
CO5	
Total	

Signature of Course teacher

SRM

SRM Institute of Science and Technology
College of Engineering and Technology
Department of Mathematics
SRM Nagar, Kattankulathur – 603203, Chengalpattu District, Tamilnadu

Slot B2
Set B

Academic Year: 2023-24 (EVEN)

Test: FT- IV — **Date** : 30.04.2024
Course Code & Title: 21MAB102T- Advanced Calculus and Complex Analysis — **Duration** : 2 Periods
Year & Sem: I & II — **Max. Marks** : 50

Course Articulation Matrix

At the end of this course, learners will be able to:			Program Outcomes (PO)											
Course Outcomes (CO)		Learning Bloom's Level	1	2	3	4	5	6	7	8	9	10	11	12
CO1	Apply multiple integrals in solving problems in Science and Engineering.	4	3	3										
CO2	Analyze vector differentiation and vector integration and related Theorems.	4	3	3										
CO3	Apply Laplace Transforms techniques in solving Engineering problems.	4	3	3										
CO4	Extend their knowledge of the Fundamentals of analytic functions	4	3	3										
CO5	Utilize Complex Integrals and Power series in solving Engineering problems.	4	3	3										

Part-A
Answer ALL the questions (4X1 = 4 Marks)

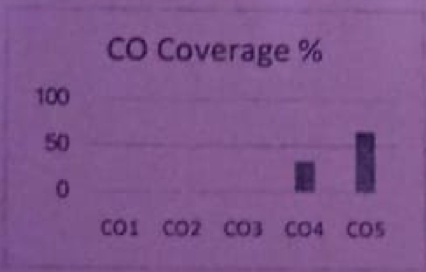
Q. No	Questions	Marks	BL	CO	PO
1	The critical point of transformation $w = z^2$ is (a) $z = 2$ (b) $z = 0$ (c) $z = 1$ (d) $z = -2$	1	2	4	1,2
2	An analytic function with constant modulus is (a) zero (b) analytic (c) constant (d) harmonic	1	1	4	1,2
3	Let $C_1: \|z-a\| = R_1$ and $C_2: \|z-a\| = R_2$ be two concentric circles $(R_2 < R_1)$, the annular region is defined as (a) within C_1 (b) within C_2 (c) within C_2 and outside C_1 (d) within C_1 and outside C_2	1	1	5	1,2
4	The part $\sum_{n=0}^{\infty} a_n (z-a)^n$ consisting of positive integral powers of $(z - a)$ is called as (a) the analytic part of the Laurent's series (b) the principal part of the Laurent's series (c) the real part of the Laurent's series (d) the imaginary part of the Laurent's series	1	1	5	1,2

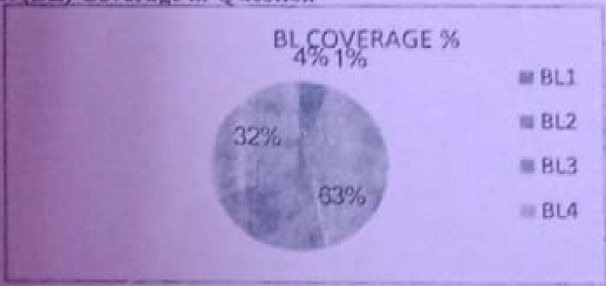
Part-B
Answer ANY TWO questions (2X8 = 16 Marks)

Q. No	Questions	Marks	BL	CO	PO
5	Find the analytic function $f(z) = u+iv$ if $u = e^x(x\cos 2y - y\sin 2y)$ using Milne Thomson method.	8	3	4	1,2

6	Evaluate $\oint_c \frac{z^2+1}{(z-1)(z-2)}\,dz$, where C is a circle $\lvert z\rvert=3$ using Cauchy Integral Formula.	8	3	5	1,2
7	Find the Laurent's series of $f(z) = \frac{z^2-1}{(z+2)(z+3)}$ valid in the region (i) $2<\lvert z\rvert<3$ (ii) $\lvert z\rvert>3$.	8	4	5	1,2
	Part-C **Answer ANY TWO questions (2X15 = 30 Marks)**				
8	i) Find the bilinear transformation which maps the points $z_1 = 0$, $z_2 = -i$ and $z_3 = -1$ onto the points $w_1 = i$, $w_2 = 1$ and $w_3 = 0$. ii) Test whether the following function is analytic or not $f(z) = x^2 - y^2 + i2xy$.	10+5	3	4	1,2
9	i) Evaluate $\oint_c \frac{4-3z}{z(z-1)(z-2)}\,dz$, where C is a circle $\lvert z\rvert = \frac{3}{2}$ by using Cauchy's Residue theorem. ii) Expand $f(z) = \frac{1}{z-3}$ at $z = 1$, in a Taylor's series upto fourth degree term.	10+5	4	5	1,2
10	Evaluate $\int_0^{2\pi} \frac{d\theta}{13+12\cos\theta}$, by using Contour Integration.	15	3	5	1,2

Course Outcome (CO) and Bloom's level (BL) Coverage in Question





Approved by the Audit Professor/Course Coordinator

Evaluation Sheet

Name of the Student:

Register No.:

Q. No	CO	Max. Marks	Marks Obtained	Total
1	4	1		
2	4	1		
3	5	1		
4	5	1		
5	4	8		
6	5	8		
7	5	8		
8	4	15		
9	5	15		
10	5	15		

Consolidated Marks:

CO	Marks Scored
CO4	
CO5	
Total	

Signature of Course Teacher