MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(Autonomous Institution – UGC, Govt. of India) (Affiliated to JNTU, Hyderabad, Approved by AICTE - - ISO 9001:2015 Certified)

Accredited by NBA & NAAC - 'A+' Grade

NIRF India Ranking, Accepted by MHRD, Govt. of India

B.TECH I YEAR II SEMESTER REGULAR END EXAMINATIONS, JUNE/JULY-2024 **ADVANCED CALCULUS** (Common to ECE, EEE)

[Time: 3 Hours]

PART – A

(10 x 1 = 10M)

[Max. Marks: 60]

Note	: 1.7	This Part	cons	sists of 10	QUE	STIONS			
	2.	Answer	All q	uestions.	Each	question	carries	1 Mark	
1		C + +	т	,	1	1	<i>i</i> 1		

1.	А	State Lagrange's Mean value theorem.	1M	BTL2
	В	Define Gamma function.	1M	BTL1
	С	Evaluate $\int_0^2 \int_0^x y dy dx$.	1M	BTL4
	D	Define Area by double integral.	1M	BTL1
	E	If $\overline{r} = x\overline{\iota} + y\overline{j} + z\overline{k}$, then find div \overline{r}	1M	BTL2
	F	Define Tangent plane and Normal line.	1M	BTL1
	G	Define work done by force.	1M	BTL1
	Н	State Stoke's theorem.	1M	BTL1
	Ι	State Cauchy-Reimann equations in cartesian coordinates.	1M	BTL1
	J	State Milne – Thomson Method.	1M	BTL1

PART – B

 $(5 \times 10 = 50M)$

- Note: 1. This Part consists of 10 QUESTIONS
 - 2. Answer any 1 question from each Section. Each question carries 10 Marks.
 - 3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Prove that $(if \ 0 < a < b < 1), \frac{b-a}{1+b^2} < tan^{-l}b - tan^{-l}a < \frac{b-a}{1+a^2}$. Hence show that $\frac{\pi}{4} + \frac{3}{25} < tan^{-l}\frac{4}{3} < \frac{\pi}{4} + \frac{1}{6}$.	5M	BTL3
2.B	Verify Cauchy's mean value theorem for the functions e^x and e^{-x} in the interval $[a, b], a, b > 0$.	5M	BTL2
	(OR)		

3.A	Prove that $\beta(m,n) = \frac{\Gamma(m)\Gamma(n)}{\Gamma(m+n)}$.	5M	BTL3
3.B	Evaluate $\int_0^{\frac{\pi}{2}} \sqrt{(\sin\theta)} d\theta \times \int_0^{\frac{\pi}{2}} \frac{d\theta}{\sqrt{(\sin\theta)}}.$	5M	BTL4

SECTION - II

4.A	Changing the order of integration in $\int_0^1 \int_{x^2}^{2-x} xy dx dy$ and hence evaluate	5M	BTL2
	the same.		

SET - 3

R22

CODE: 2200BS02

R22

SET - 3

4.B	Show that the area between the parabolas $y^2 = 4ax$ and $x^2 = 4ay$ is	5M	BTL2
	$\frac{16}{3}a^2$.		
	(OR)		
5.	Find the volume of the ellipsoid $\frac{x^2}{a^2} + \frac{y^2}{b^2} + \frac{z^2}{c^2} = 1.$	10M	BTL3

SECTION - III

6.A	Find the directional derivative of $\phi = 5x^2y - 5y^2z + 2.5z^2x$ at the point	5M	BTL2
	P (1,1,1) in the direction of the line $\frac{x-1}{z} = \frac{y-3}{z} = z$.		
	2 -2		
-			
6.B	Show that $\nabla^2(r^n) = n(n+1)r^{n-2}$	5M	BTL2
	Show that $V(I) = II(II + I)I$.		
	(OR)		
7.A	Find the <i>div F</i> and curl <i>F</i> , where $= grad(x^3 + y^3 + z^3 - 3xyz)$.	5M	BTL2
7.B	Find the constants a, b, c so that the vector $\overline{r} = (x + 2y + az)\overline{i} + \overline{i}$	5M	BTL4
	$(bx - 3y - z)\overline{i} + (4x + cy + 2z)\overline{k}$ is an irrotational. Also find scalar		
	π other tiple density in π - ∇d		
	potential φ such that $r = v\varphi$.		

SECTION - IV

8.A	Compute the line integral $\int_C (y^2 dx - x^2 dy)$ about the triangle whose	5M	BTL3
	vertices are $(1,0)$, $(0,1)$ and $(-1,0)$.		
8.B	Use Divergence theorem to evaluate $\iint_{s} \overline{F} ds$, where $\overline{F} = 4x\overline{i} - 2y^2\overline{j} + z^2\overline{k}$	5M	BTL4
	and S is the surface bounded by the region $x^2 + y^2 = 4$, $z = 0$ and $z = 3$.		
	(OR)		

9.	Verify Green's theorem for $\int [(3x^2 - 8y^2)dx + (4y - 6xy)dy]$, where C is	10M	BTL4
	the region bounded by $y = \sqrt{x}$ and $y = x^2$.		

SECTION - V

10.A	If $f(z)$ is an analytic function with constant modulus, show that $f(z)$ is a	5M	BTL3
	constant.		
10.B	If $f(z)$ is a regular function of z, prove that	5M	BTL3
	$\left\{\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2}\right\} f(z) ^2 = 4 f^I(z) ^2.$		

(OIC)

11.A	Find the analytic function, whose real part is $e^{2x}(x \cos 2y - y \sin 2y)$.	5M	BTL2
11.B	Show that $u = \frac{1}{2} log(x^2 + y^2)$ is harmonic and find its harmonic conjugate.	5M	BTL3

____***_____



PART – A

 $(10x \ 1 = 10M)$

Note: 1. This Part consists of 10 QUESTIONS

2. Answer All Questions. Each question carries 1 Mark.

1	А	Define node and mesh.	1M	BTL1
	В	Classify the energy sources.	1M	BTL1
	С	Define power factor.	1M	BTL3
	D	State Norton's Theorem.	1M	BTL1
	E	Why DC series motor should not be started without load?	1M	BTL1
	F	What is Back E.M.F?	1M	BTL2
	G	Express the term slip in the Induction motor.	1M	BTL1
	Н	Illustrate why single-phase Induction motor is not self-starting.	1M	BTL2
	Ι	List out the Safety precautions to be followed against electric shock.	1M	BTL1
	J	Compare circuit breaker and fuse.	1M	BTL2

PART – B

$(5 \times 10 = 50M)$

- Note: 1. This Part consists of 10 QUESTIONS
 - 2. Answer any 1 question from each Section. Each question carries 10 Marks.
 - 3. Illustrate your answers with NEAT sketches wherever necessary.

	SECTION		
2.A	Estimate the current through the Various branches in the circuit of the following	5M	BTL5
	figure. Using mesh analysis.		
	30Ω 		
	200 V 1 30 Q 60 Q		
2.B	A Resistor of 50 Ohm has a potential difference of 100 Volts across the DC	5M	BTL5
	supply for 1 Hour. Examine the value of (i) Current (ii) Conductance (iii) Power		
	(iv) Energy.		

(OR)

3.A	Calculate (i) equivalent resistance across the terminal of the supply (ii) total current supplied by the source (iii) power delivered to the 16Ω resistor in the circuit shown below	6M	BTL5

)E: 2	202ES01 R22		SET - 2
3.B	Write the mesh current equation in the circuit shown in the figure and determine the currents.	4M	BTL5
	SECTION - II		
4.A	Three similar coils connected in star, take a power of 1.5KW at a power factor of 0.2 lagging from a 3 phase, 400V, 50Hz supply. Calculate the resistance and inductance of each coil.	5M	BTL5
4.B	Analyze the following network Delta into Star network and find the value as shown in Fig.	5M	BTL5
	(OR)		
5.A	A balanced star connected load having an impedance $(15+j20) \Omega$ per phase is connected to a three phase 440V, 50 Hz supply. Find (i) The line currents and (7 (ii) The power absorbed by the load.	5M	BTL5
5.B	A DC Voltage of 100 Volts is applied to Series RL Circuit with R=25 Ohm. Calculate the value of the current in which the time constant is twice.	5M	BTL5
()	SECTION - III	$\overline{\Omega}$	
0.A	day efficiency (iii) Losses in transformer (iv) Regulation of Transformer	OIVI	BILS
6.B	Derive the EMF Equation of Transformer.	4M	BTL5
	(OR)		
7.A	A single phase 5KVA transformer has 2000 primary turns and 1000 secondary turns if the flux flowing in the core is 0.4 Weber's. If the frequency is 50Hz then calculate the primary and secondary induced voltages.	5M	BTL5
7.B	Why is it more difficult to cool a transformer than any other electrical rotating machine?	5M	BTL5
	SECTION – IV		
8.A	Why the single-phase Induction motors are not Self-starting? And compare the contrast of Squirrel Cage and Slip ring Induction Motors.	6M	BTL5
8.B	Draw the torque slip characteristics of three phase induction motor.	4M	BTL5
0.4	(UR)	714	חידת ו
9.A	Derive and explain the torque equation of three phase induction motor with necessary expressions.	/M	BILS
9.B	Justify which type of induction motor develops higher starting torque.	3M	BILS
10 4	SECTION – V		חידים /
10.A	Definition of the tensor of activity with the tensor of		BIL
10.B	Briefly explain the types of wiring with a neat diagram.	4M	BTL
11 4	(UK)	t 711	דידים
11.A	characteristics of batteries		BIL
11.B	Differentiate the characteristics of MCB, ELCB, and MCCB	3M	BIL

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN (Autonomous Institution – UGC, Govt. of India)

(Affiliated to JNTU, Hyderabad, Approved by AICTE - - ISO 9001:2015 Certified)

Accredited by NBA & NAAC – 'A+' Grade

NIRF India Ranking, Accepted by MHRD, Govt. of India

B.TECH I YEAR II SEMESTER REGULAR END EXAMINATIONS, JUNE/JULY-2024 ENGINEERING CHEMISTRY (Common to EEE, ECE, CSE-DS, CSE-IOT, CS&IT, IT)

[Time: 3 Hours]

[Max. Marks: 60]

PART – A

 $(10x \ 1 = 10M)$

Note: 1. This Part consists of 10 QUESTIONS

2. Answer All Questions. Each question carries 1 Mark

1.	Α	State the drawbacks of crystal field theory.	1M	BTL1
	В	What is doping? Mention the effect of impurities doping on conductivit	1M	BTL1
	С	What is ozonization? How it is useful in the treatment of water.	1M	BTL2
	D	What is potable water? Give any two specifications of potable water.	1M	BTL1
	E	Write the Nernst equation.	1M	BTL1
	F	What is metal cladding?	1M	BTL2
	G	Write any differences between S _N 1 and S _N 2 reactions.	1M	BTL1
	Η	Define enantiomers and diastereomers.	1M	BTL1
	Ι	Write the formula of force constant.	1M	BTL2
	J	What are the various types of electronic excitations?	1M	BTL3

PART – B

 $(5 \times 10 = 50 \text{M})$

Note: 1. This Part consists of 10 QUESTIONS

2. Answer any 1 question from each Section. Each question carries 10 Marks.

3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Write a note on linear combination of atomic orbital.	5M	BTL2
2.B	Explain the band structure of solids with suitable illustrations	5M	BTL2

	(OR)		
3.A	Discuss the crystal field splitting of <i>d</i> -orbitals in square planar geometry.	5M	BTL3
3.B	Draw and discuss the molecular orbital energy level diagram of O ₂ .	5M	BTL3

4.A	Write a note on temporary and permanent hardness of water.	5M	BTL2
4.B	Provide a note on scales and sludges.	5M	BTL3

SECTION - II

 $\langle OD \rangle$

R22

CODE: 2200BS07

(OR)

R22

5.A	Discuss the complexometric method of estimating hardness of water.	5M	BTL4
5.B	Explain how the ion-exchange process is useful in the treatment of water.	5M	BTL2

SLCHON III

6.A	Provide an account on potentiometric titrations.	5M	BTL4
6.B	Discuss CH ₃ OH–O ₂ fuel cells.	5M	BTL3

(OR)

7.A	Write a note on potentiometric sensors.	5M	BTL2
7.B	Explain the factors that affect the rate of corrosion.	5M	BTL2

SECTION - IV

8.A	Discuss the conformational analysis of n-butane.	5M	BTL3
8.B	Write a brief note on the oxidations of alcohols using KMnO ₄ and chromic acid.	5M	BTL4

	(OR)		
9.A	Explain Markownikoff and anti-Markownikoff additions.	5M	BTL2
9.B	Write the synthesis and pharmaceutical applications of paracetamol.	5M	BTL2

SECTION-V

10.A	Derive Beer-Lamberts Law.	5M	BTL4
10.B	Write a note on the chemical shift in ¹ H NMR spectroscopy.	5M	BTL2

	(OR)		
11.A	Provide a note on magnetic resonance image.	5M	BTL4
11.B	Discuss the modes of vibrations under IR spectra.	5M	BTL3

____***_____

SET - 3

MALLA REDDY ENGINEERING COLLEGE FOR WOMEN

(Autonomous Institution – UGC, Govt. of India)

(Affiliated to JNTU, Hyderabad, Approved by AICTE - - ISO 9001:2015 Certified)

Accredited by NBA & NAAC – 'A+' Grade

NIRF India Ranking, Accepted by MHRD, Govt. of India

B.TECH I YEAR II SEMESTER REGULAR END EXAMINATIONS, JUNE/JULY-2024 PYTHON PROGRAMMING

(Common to ALL)

[Time: 3 Hours]

[Max. Marks: 60]

PART – A

(10 x 1 = 10 M)

Note: 1. This Part consists of 10 QUESTIONS

	2. Answer All questions. Each question carries 1 Mark.			
1	А	Discuss the differences between interactive mode programming	1M	BTL2
		and scripting mode programming in Python		
	В	Define slicing and indexing in Python	1M	BTL1
	С	Analyze the advantages and disadvantages of using lists over tuples in	1 M	BTL2
		Python		
	D	Differentiate between mutable and immutable data types in Python	1M	BTL2
	Е	Compare and contrast Python's lambda functions with regular	1M	BTL2
		functions		
	F	Write a Python program to demonstrate the use of keyword arguments in	1M	BTL2
		functions.		
	G	Describe the purpose and functionality of the `collections` module in	1 M	BTL1
		Python, with example.		
	Η	Justify how inheritance in Python promotes code reusability.	1M	BTL2
	Ι	List any 4 inbuilt functions and their usage in Python programming	1M	BTL2
	J	Identify the utility of `finally` block in exception handling in Python.	1M	BTL2

PART - B

 $(5 \times 10 = 50M)$

Note: 1. This Part consists of 10 QUESTIONS

2. Answer any 1 question from each Section. Each question carries 10 Marks.

3. Illustrate your answers with NEAT sketches wherever necessary.

SECTION - I

2.A	Illustrate the process of writing a basic Python program and discuss the	5M	BTL2
	steps involved.		
2.B	Develop a Python function that takes a number as input and returns its	5M	BTL4
	factorial.		

	(OR)		
3.A	Create a Python program to generate and print the Fibonacci sequence up	5M	BTL4
	to a specified number		
3.B	Evaluate the functionalities and features of Jupyter Notebook and Spyder	5M	BTL6
	as Python IDEs.		

SECTION - II

4.A	Differentiate between forward direction slicing with a positive step and	5M	BTL3
	backward direction slicing with a negative step using suitable examples		

CODE: 2205ES02

R22

SET	-	2
-----	---	---

	4.B	Analyze the use of break, continue, and pass statements within loops and	5M	BTL4
L		conditional statements in Python using suitable examples		

(OR)

5.A	Construct a program that uses a while loop to reverse the digits of an	5M	BTL4		
	integer number.				
5.B	Implement a function that converts a given decimal number to binary,	5M	BTL4		
	octal, and hexadecimal formats				

SECTION - III

6.A	Explain how dictionaries in Python handle key-value pairs and the	5M	BTL2
	underlying hash table implementation		
6.B	Create a dictionary and use built-in functions to perform various	5M	BTL6
	operations such as getting keys, values, and items.		

(OR)

7.A	Implement a set and demonstrate the use of union, intersection, and	5M	BTL4
	difference operations.		
7.B	Create a list of integers and demonstrate how to update, slice, and iterate	5M	BTL6
	through the list.		

SECTION - IV

8.A	Explain the difference between positional arguments and keyword	5M	BTL2
	arguments in Python functions		
8.B	Construct a Python function that uses a lambda function to filter even	5M	BTL4
	numbers from a list.		

	(OR)		
9.A	Explain the role of custom exceptions in Python and how they enhance	5M	BTL2
	error handling.		
9.B	Write a Python program to demonstrate the usage of the `try`, `except`,	5M	BTL3
	and `finally` blocks.		

SECTION - V

10.A	Interpret the role of constructors in Python and the difference between	5M	BTL3
	parameterized and non-parameterized constructors.		
10.B	Develop a Python class named `Book` with attributes for title, author,	5M	BTL4
	and price, and a method to display the book's information.		

	(OR)		
11.A	Outline the steps to create a custom module in Python and how to import	5M	BTL4
	it into a project.		
11.B	Write a program that utilizes the `random` module to simulate rolling a	5M	BTL3
	pair of dice and output the result.		
