CODE: 2200BS03 | R22 | 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
ADVANCED CALCULUS AND TRANSFORM TECHNIQUES
(Common to CSE, CSE-DS, AIML, IOT, CS, CSIT, 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.	A	State Rolle's theorem.	1M	BTL2
	B	Prove that $\Gamma(n+1) = n\Gamma n$	1M	BTL2
	C	Evaluate $\int_0^5 \int_0^{x^2} x(x^2+y^2)dxdy$	1M	BTL4
	D	Sketch the region of the integral $\int_{-a}^{a} \int_0^{\sqrt{a^2-x^2}} f(x,y)dxdy$	1M	BTL2
	E	Prove that $\nabla(r^n) = n\, r^{n-2}R$	1M	BTL2
	F	Define divergence F and curl F.	1M	BTL1
	G	State the Dirichlet's conditions for Fourier series.	1M	BTL2
	H	Write the Fourier sine transform pair formula.	1M	BTL2
	I	Define Laplace transforms.	1M	BTL1
	J	Find Z (1)	1M	BTL1

PART – B

(5 x 10 = 50M)

Note: 1. ThisPart 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 $(0 < a < b < 1), \frac{b-a}{1+b^2} < \tan^{-1} b - \tan^{-1} a < \frac{b-a}{1+a^2}$	5M	BTL4
2.B	Verify Cauchy's mean value theorem for e^x and e^{-x} in the interval (a,b)	5M	BTL5

(OR)

3.A	Prove that $\beta(m,n) = \frac{\Gamma(m)\Gamma(n)}{\Gamma(m+n)}$	5M	BTL4
3.B	Evaluate $\int_0^{\infty} e^{-ax} x^{m-1} \sin bx\, dx$ in terms of Gamma function.	5M	BTL5

SECTION - II

4.A	Evaluate $\int_0^1 \int_x^{x^2} (x^2+y^2)dxdy$	5M	BTL4
4.B	Evaluate $\int_0^a \int_0^b \int_0^c (x^2+y^2+z^2)dxdydz$	5M	BTL5

(OR)

5.A	Change the order of integration in $I=\int_{0}^{4a}\int_{\frac{x^2}{4a}}^{2\sqrt{ax}} dydx$ and hence evaluate it.	5M	BTL4
5.B	Find the volume of the ellipsoid $\frac{x^2}{a^2}+\frac{y^2}{b^2}+\frac{z^2}{c^2}=1$	5M	BTL2

SECTION - III

6.A	Show that $\nabla^2(r^n)=n(n+1)r^{n-2}$	5M	BTL3
6.B	If $u=x^2yz, v=xy-3z^2$, find (i) $\nabla(\nabla u \bullet \nabla v)$ (ii) $\nabla(\nabla u \times \nabla v)$	5M	BTL5

(OR)

7.A	Find the work done in moving a particle in the force field $F=3x^2I+(2xz-y)J+zK$ along (i) the straight line from (0,0,0) to (2,1,3) (ii) the curve defined by $x^2=4y, 3x^3=8z$ from $x=0\ to\ x=2$	5M	BTL2
7.B	Using the line integral, compute the work done by the force $F=(2y+3)I+xzJ+(yz-x)K$ when it moves a particle from the point (0,0,0) to the point (2,1,1) along the curve $x=2t^2, y=t, z=t^3$	5M	BTL5

SECTION – IV

8.A	Find the Fourier series for the function $f(x)=e^x$ defined in $(-\pi,\pi)$	5M	BTL4
8.B	Find the Fourier series for $f(x)=x^2$ $f(x)=x^2$ in $-\pi\le x\le\pi$. And hence deduce that $\frac{1}{1^2}+\frac{1}{2^2}+\frac{1}{3^2}+.....$	5M	BTL5

(OR)

9.A	Find the Fourier cosine Transform of the function $f(x)=\begin{cases}\sin x, & 0\le x<a\\ 0 & x>a\end{cases}$	5M	BTL2
9.B	Find the Fourier transform of $f(x)$ if $f(x)=\begin{cases}1-\lvert x\rvert, & \lvert x\rvert<1\\ 0 & \lvert x\rvert>1\end{cases}$ Hence deduce that $\int_0^\infty\left(\frac{\sin t}{t}\right)^4 dt=\frac{\pi}{3}$	5M	BTL2

SECTION – V

10.A	Find $L^{-1}\left[\frac{5s+3}{(s-1)(s^2+2s+5)}\right]$	5M	BTL2
10.B	Apply convolution theorem to evaluate $L^{-1}\left[\frac{s^2}{(s^2+a^2)^2}\right]$	5M	BTL5

(OR)

11.A	Find the inverse Z –transform of $\frac{2(z^2-5z+6.5)}{(z-2)(z-3)^2}\ for 2<\lvert z\rvert<3$	5M	BTL2
11.B	Using Convolution theorem ,find $Z^{-1}\left[\frac{z^2}{(z-1)(z-3)}\right]$	5M	BTL5

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CODE: 2200BS06 | R22 | SET - 2

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B.TECH I YEAR II SEMESTER REGULAR END EXAMINATIONS, JUNE/JULY-2024
APPLIED PHYSICS
(Common to CSE, CSE- AIML, CS)

[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	A	Distinguish between wave and particle.	1M	BTL2
	B	What are intrinsic and extrinsic semiconductors?	1M	BTL1
	C	What do you mean by photoluminescence?	1M	BTL1
	D	How is laser light differing from ordinary light?	1M	BTL2
	E	What is magnetic dipole? How does one assign direction to a magnetic dipole?	1M	BTL1
	F	Describe the physical significance of wave function, ψ.	1M	BTL1
	G	Draw the energy band diagram of unbiased p-n junction diode.	1M	BTL3
	H	What are the advantages of avalanche photo diode?	1M	BTL1
	I	An optical fiber has a core refractive index of 1.55 and cladding refractive index of 1.50. Find its numerical aperture.	1M	BTL3
	J	The dielectric constant of a metal is infinity. Substantiate your response.	1M	BTL3

PART – B

(5 x 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	What is Compton effect? Derive an expression for Compton shift.	6M	BTL1
2.B	Write a note on photoelectric effect.	4M	BTL4

(OR)

3.A	State the de-Broglie's hypothesis.	3M	BTL1
3.B	Give the experimental evidence for the wave character of an electron.	7M	BTL2

SECTION - II

4.A	Differentiate between p-type and n-type semiconductors.	4M	BTL4

4.B	Discuss the variation of Fermi level with temperature and impurities in case of n-type semiconductor.	6M	BTL1

(OR)

5.A	State and derive an expression for Hall coefficient for p-type semiconductor.	6M	BTL5
5.B	In a Hall Effect experiment, a current of 0.25 A passing through a metal strip of 5 mm wide and 0.2 mm thick developed a Hall voltage of 0.15 mV when a magnetic field of 2000 Gauss is applied. Find the drift velocity of the carriers.	4M	BTL3

SECTION - III

6.A	Explain the construction and working of LED.	7M	BTL1
6.B	Determine the colour of radiation emitted by a LED having band gap of 1.9 eV.	3M	BTL3

(OR)

7.A	Discuss the photovoltaic effect and the construction of solar cell.	6M	BTL1
7.B	Mention the applications of solar cells	4M	BTL3

SECTION – IV

8.A	With neat diagrams, explain the structure, refractive index profile and transmission of a signal through a multi-mode step-index optical fiber.	7M	BTL2
8.B	Give the advantages of multi-mode step-index optical fibers.	3M	BTL3

(OR)

9.A	What are Einstein's A and B coefficients? Find the relation between them.	6M	BTL1
9.B	Describe any two methods of achieving population inversion.	4M	BTL1

SECTION – V

10.A	Explain the origin of magnetic moment at the atomic level.	6M	BTL1
10.B	Find the value of spin magnetic moment of an electron if it has one Bohr magneton.	4M	BTL2

(OR)

11.A	Derive Calusius-Mossotti equation for a solid dielectric exhibiting electronic polarizability.	7M	BTL2
11.B	Illustrate the consequences of Calusius-Mossotti equation.	3M	BTL1

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CODE: 2203ES01 | R22 | SET - 3

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

COMPUTER AIDED ENGINEERING GRAPHICS

(CSE)

[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.	A	What are the primary uses of AutoCAD?	1M	BTL1
	B	Which file format is used in the AutoCAD design?	1M	BTL3
	C	Define Ellipse	1M	BTL1
	D	The curve generated by a point on the circumference of a circle, rolling along another circle inside it, is called ---------	1M	BTL2
	E	Differentiate First and Third angle projection	1M	BTL2
	F	Distinguish between the true length and apparent length of a line.	1M	BTL2
	G	What is meant by Auxiliary projection?	1M	BTL1
	H	Differentiate frustum and truncated solid?	1M	BTL2
	I	State the different methods of drawing the isometric projection.	1M	BTL2
	J	Distinguish between isometric view and isometric projection	1M	BTL2

PART – B

(5 x 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.	Trace the curves when the distance of the focus from directrix is 45mm with eccentricity of 3/2. Name the curve. Draw a normal and tangent at a point which is 54mm from the focus.	10M	BTL3

(OR)

3.	A circle of 50mm diameter rolls along the floor for a half revolution and then on an adjacent wall for another half revolution. Draw the curve traced out by a point on the circumference of the circle at the top of the circle.	10M	BTL4

SECTION - II

4.	A line AB 90mm long is inclined at 40 degrees to HP and 25 degrees to VP. The end A is 10mm above HP and 25mm in front of VP. Draw its projections and determine its traces.	10M	BTL5

(OR)

5.	The projections of a line measures 90mm in top view and 70mm in front view. The mid point of the line is 40mm above HP and 50mm in front of VP. One end of the line is 15mm in front of VP, while the other end is nearer to HP. Draw the projections and determine its true length, true inclinations with HP and VP and traces.	10M	BTL5

CODE: 2203ES01	R22	SET - 3

SECTION - III

6.	A regular hexagon of 30mm side has a corner in HP. Its surface is inclined at 40 degrees to the HP. And the top view of the diagonal passing through the corner on which it is resting makes an angle of 30 degrees with XY. Draw its projections.	10M	BTL4

(OR)

7.	A circle of 50mm diameter is resting on the ground on a point with its plane inclined at 30 degrees to the ground. Draw the projections of the circle when the diameter passing through the resting point makes an angle 45 degrees with the VP.	10M	BTL3

SECTION – IV

8.	A pentagonal pyramid of base 30 and height 70 rests on one of its corners of the base on HP, the base being tilted up until the vertex is 60 above HP. Draw the projections of the pyramid with the edge of the base opposite to the corner on which it is resting is made parallel to VP.	10M	BTL4

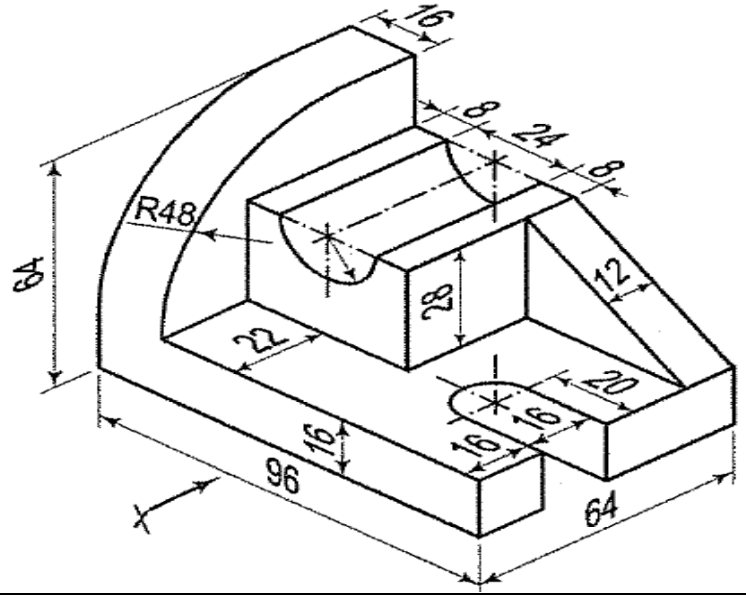
(OR)

9.	A cone of base of diameter of 50 and height 70 has one of its generators in HP and making an angle of 30o with VP. Draw the projections when the apex is nearer to VP.	10M	BTL5

SECTION – V

10.	A frustum of a cone of bottom base 40 mm diameter, top base 20 mm is placed at the centre of the top base of a hexagonal prism of base side 25 mm and axis 70 mm long, so that the axes of both the solids are coinciding and is vertical. Draw the isometric view of the combination of the solids.	10M	BTL4

(OR)

11.	Construct the front view, side view from right and top view for the isometric view given below in figure. 	10M	BTL5

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CODE: 2200HS01 | R22 | SET - 3

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

ENGLISH

(Common to CSE, CSE- AIML, CS)

[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	A	Define Cohesion and Coherence	1M	BTL1
	B	Add suitable prefix/suffix to the words listed below. i) cultural b) email	1M	BTL2
	C	Name two of the major dynasties of South India.	1M	BTL3
	D	Separate the following into two groups, phrases and clauses. *The students are shouting.*	1M	BTL4
	E	What is 'Sanforisation'?	1M	BTL1
	F	These pliers _____ not strong enough for the job.(is/are)	1M	BTL3
	G	Skimming means _____	1M	BTL3
	H	There is _____ that all fats should be avoided to be healthy.(truth/myth)	1M	BTL3
	I	Rewrite the given sentence after placing the modifier in the right place.The results will be known after all the votes have been counted.	1M	BTL6
	J	Who is Zhou Qunfei?	1M	BTL1

PART – B

(5 x 10 = 50M)

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

SECTION - I

2.A	According to Raman, why is the sea blue in color?	5M	BTL2
2.B	List out various techniques for Effective Reading	5M	BTL4

(OR)

3.A	Write a meaningful paragraph on the following topic: Pros and cons of Social networking sites	5M	BTL2
3.B	i) Fill in the blanks with A, An or The a) _____ darkest cloud has a silver lining. b) ____ word to the wise is sufficient. ii) Fill in the blanks with suitable prepositions a) During our trip to Shimla, the train went _____ a tunnel. b) My teacher was angry ___ me because I was very late for his class. c) Do you speak any other languages _____ English?	5M	BTL4

SECTION - II

4.A	Name some of the major dynasties of South India.	5M	BTL2
4.B	i) Form antonyms for the words given below. a) positive b) artificial c) mortal ii) Form synonyms for the words given below. a) determine b) resemble	5M	BTL4

(OR)

5.A	Write a letter to the local bookseller enquiring if copies of the books prescribed in your syllabus are available with him/her. Find out about the mode of purchase available	5M	BTL1
5.B	Fill in the blanks with the right verb forms from the verbs given in brackets. a) The students _____ (play)cricket since this morning. b) They _____ (distribute) note books to the poor students 3 months ago. c) If I (find) a good job, I'll move to Mumbai. d) What _____(you / cook) tonight? e) He met his wife when he _____(work) in Bangalore.	5M	BTL4

SECTION - III

6.A	List out the evolution of blue jeans discussed in the lesson.	5M	BTL2
6.B	Choose one of the words in brackets to fill the gap. i) Shalini worked harder _____(than/then) she had ever worked before. ii) Everyone is _____ (all ready/already) to play Bingo. iii) Sanvi _____ (accepted /expected) the scholarship with pride. iv) I advised her to follow my _____ (advise/advice) v) Be sure not to _____ (lose/loose) your chance.	5M	BTL2

(OR)

7.A	Mr. Vijay spends his time on different activities daily (in hours): Office- 9; Exercise- 1; Travelling – 2; Watching shows-3; Sleeping -7; Miscellaneous- 2. Draw a pie chart for this information.	5M	BTL1
7.B	Assess the passage given below and answer the questions that follow: Questions: Bachendri's story stands as an example of how going against your family's wishes can be hard but important from time to time. Raised surrounded by the Himalayas towering around her hometown, she intended to climb it one day and focused on becoming a professional mountain climber. Moreover, she received a lot of discouragement for being a girl trying to take on such a physically challenging path. This only fuelled her passion; she was selected to be part of an expedition to the top of Mt. Everest. She braved being buried in snow, fierce icy winds and even losing sensation in her toes. She was one of the few who finally made it to the top creating history by being the first Indian woman to reach the summit. 1. What does Bachendri's story stand for? 2. What was the childhood dream of Bachendri? 3. "This only fueled her passion," What is that? 4. Name the two brave things of Bachendri mentioned in the passage? 5. Write the meaning of 'summit'.	5M	BTL4

SECTION – IV

8.A	Discuss the health effects of refined grains in your diet.	5M	BTL3
8.B	Give the meaning of the idioms and phrases and use them in sentences of your own. i) break a leg ii) man of letters iii) bread and butter iv) figure out v) break down	5M	BTL4

(OR)

9.A	Write an argumentative essay on "Is artificial intelligence good for society?"	5M	BTL2
9.B	Construct FIVE meaningful sentences on the following pattern.	5M	BTL4

Subject	Verb	Object	to- infinitive
We	asked	the driver	to drive the car slowly

SECTION – V

10.A	Give an account of Ms. Zhou's education and childhood.	5M	BTL2
10.B	Write short notes on Technical Vocabulary and usage.	5M	BTL4

(OR)

11.A	Outline the different sections of a report and what they include.	5M	BTL2
11.B	Correct the following sentences. i) She's married with an engineer. ii) Remember a movie we watched last week iii) Mary went to work and John went to the party. iv) Last year they build a wall around the house. v) Indian force are known for their loyalty and integrity.	5M	BTL4

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CODE: 2205ES02 | R22 | SET - 2

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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 = 10M)

Note: 1. This Part consists of 10 QUESTIONS
2. Answer **All questions**. Each question carries 1 Mark.

1	A	Discuss the differences between interactive mode programming and scripting mode programming in Python	1M	BTL2
	B	Define slicing and indexing in Python	1M	BTL1
	C	Analyze the advantages and disadvantages of using lists over tuples in Python	1M	BTL2
	D	Differentiate between mutable and immutable data types in Python	1M	BTL2
	E	Compare and contrast Python's lambda functions with regular functions	1M	BTL2
	F	Write a Python program to demonstrate the use of keyword arguments in functions.	1M	BTL2
	G	Describe the purpose and functionality of the `collections` module in Python, with example.	1M	BTL1
	H	Justify how inheritance in Python promotes code reusability.	1M	BTL2
	I	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 x 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 steps involved.	5M	BTL2
2.B	Develop a Python function that takes a number as input and returns its factorial.	5M	BTL4

(OR)

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

SECTION - II

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

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

(OR)

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

SECTION - III

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

(OR)

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

SECTION – IV

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

(OR)

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

SECTION – V

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

(OR)

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

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