QP Code: S253A022 Reg. No ☐☐☐☐☐☐☐☐☐☐ AY 23

Gandhi Institute of Engineering and Technology University, Odisha, Gunupur (GIET University)

B. Tech (Third Semester – Regular & Supplementary) Examinations, November 2025

23BBSBS23001 – Engineering Mathematics-III

(Common to All except BT, CSE, CSE(AIML), CSE(DS), ECE)

Time: 3 hrs Maximum: 60 Marks

Answer ALL questions

(The figures in the right hand margin indicate marks)

PART – A (2 x 5 = 10 Marks)

Q.1. Answer ***ALL*** questions

		CO #	Blooms Level
a.	Is the function f (z) = e^{-z} is analytic? Justify your answer.	CO1	K2
b.	State Cauchy's Integral formula	CO2	K2
c.	What is Truncation error? Explain with an example.	CO3	K2
d.	Define Initional value problem, with an example.	CO4	K1
e.	What is the Probability of drawing a card which is either king or spade from pack of cards?	CO5	K2

PART – B (10 x 5 = 50 Marks)

<u>Answer ***ALL*** the questions</u> Marks CO # Blooms Level

2.a. Prove that v = - e^{-x} siny is harmonic. Hence find its conjugate. 5 CO1 K3

b. Evaluate $\int cos^2 z\, dz$ along |z| = π in the right half plane. 5 CO1 K3

(OR)

c. Find the image of the curve $x^2+y^2=16$ under the mapping w= $\frac{1}{z}$ 5 CO1 K3

d. Find the Linear Fractional Transformation (LFT) which maps the points i,0,1 onto 2+i,2,3 respectively. 5 CO1 K3

3a. State and prove Cauchy's Integral theorem 5 CO2 K3

b. Find the Laurent series of $\frac{z^2}{(z-2)(z-3}$, $valid\ in\ the\ region\ 2 \le |z| \le 3$. 5 CO2 K3

(OR)

c. Evaluate the Integral $\int_{-\infty}^{\infty} \frac{1}{(x^2+4)(x^2+9)} dx$ . . 5 CO2 K3

d. Evaluate $\oint \frac{e^z+z}{z^3-z} dz$ C : $|z| = 3$ by Cauchy Residue Theorem. 5 CO2 K3

4.a. Find the Lagrange's Interpolating Polynomial for the following data. 5 CO3 K3

X	-1	0	2	3
F(x)	-8	3	1	12

b. Find a Real root of 3x - cosx - 1= 0, by Newton-Raphson Method.. 5 CO3 K3

(OR)

c. Find a Real root of $x^3 + x - 5 = 0$, by Fixed Point Iteration Method 5 CO3 K3

d. Find f (9) for the data given below. 5 CO3 K3

X	4	6	8	10
F(x)	1	3	6	8

5.a. Evaluate $\int_0^1 \frac{dx}{1+x^2}$ using Trapezoidal Rule with h=0.1 5 CO4 K3

b.	Find y(0.1) and y(0.2) by Taylor Series Method given $\frac{dy}{dx} = x - y^2$, y(0)=1	5	CO4	K3
	(OR)			
c.	Find y (0.1) using R-K Method. given that $\frac{dy}{dx} = -y$, $y(0) = 1$	5	CO4	K3
d.	Evaluate $\int_0^1 \frac{dx}{1+x}$ using Simpson's rule .	5	CO4	K3
6.a	The probability density function f(x) = $\begin{cases} k\,(1 - x^2) & ; 0 < x \le 1 \\ 0\,; & \text{otherwise} \end{cases}$ Find k and Mean.	5	CO5	K3
b.	Find the Regression line Y on X for the points (10,40) (12,38) (13, 43) (12,45) (16,37) (15,42)	5	CO5	K3
	(OR)			
c.	Find the Correlation Coefficient for the data	5	CO5	K3

x	10	12	13	16	17
y	10	22	27	29	33

d.	State and Prove Baye's theorem	5	CO5	K3

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