



R17 Regulation

Subject code: 1B3AA

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A+' Grade)

B.Tech II Year I Semester supplementary Examinations, February 2024

MATHEMATICS - IV

(Common to CE,EEE,ME,ECE,CSE & IT)

Maximum Marks: 70

Date: 16.02.2024 Duration: 3 hours

- Note: 1. This question paper contains two parts A and B.
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks (10X2M=20 Marks)

1	Define Entire function	
2	Write the definition of invariant or fixed points of the Bilinear Transformation	
3	Write the statement of Cauchy's theorem	
4	Write the statement of Laurent's theorem	
5	Find the zeros and its orders of $f(z) = (z-2)^3(z-3)^2$	
6	Find the poles of $f(z) = \frac{z.e^z}{(z-1)^3}$	
7	Define periodic function	
8	Define Even function	
9	Write formula for finite Fourier sine transform of $f(x)$ in $0 < x < c$	
10	State convolution theorem	

Part-B

Answer any all the questions (10M X 5=50Marks)

11	Show that $u(x, y) = e^x \cos y$ is harmonic and find its harmonic conjugate $v(x, y)$, also the analytic function	[10M]
	OR	
12	Find the bilinear Transformation that maps the points (0, -i, -1) into the points (i, 1, 0).	[10M]
13	Evaluate $\int_C \frac{1}{z^3(z+4)} dz$ where C is the circle $ z = 2$	[10M]
	OR	
14	Find the Laurent's expansion of $f(z) = \frac{1}{z^2-4z+3}$ for $1 < z < 3$	[10M]
15	Find the Residue of $\frac{z^2-2z}{(z+1)^2(z^2+1)}$	[10M]
	OR	
16	Evaluate $\int_C \frac{4-3z}{z(z-1)(z-2)} dz$; where c is the circle $ z = \frac{3}{2}$. using residue theorem	[10M]
17	Obtain the Fourier series for the function $f(x) = e^x$ from $x=0$ to $x=2\pi$	[10M]
	OR	

18	Obtain the half range Fourier Sine series for the function $f(x) = e^{ax}$ from $x=0$ to $x=\pi$.	[10M]
19	Find Fourier sine and cosine transform of e^{-ax} and hence deduce the inverse formula	[10M]
	OR	
20	Find the finite Fourier sine and cosine transform of $f(x) = \sin ax$ in $(0,\pi)$	[10M]