

SECTION-B

Q2) Using Laplace Transform, Evaluate $\int_0^{\infty} \frac{\cos at - \cos bt}{t} dt$

Q3) Solve the following system of equations using the Gauss Jacobi Method :

$$2x + y + 6z = 9; 8x + 3y + 2z = 13; x + 5y + z = 7.$$

Q4) 500 articles were selected at random out of a batch containing 10,000 articles, and 30 were found to be defective. How many defective articles would you reasonably expect to have in the whole batch?

Q5) Using Modified Euler's method, Obtain a solution of

$$\frac{dy}{dx} = x + \sqrt{y}, y(0) = 1, \text{ for the range } 0 \leq x \leq 0.4 \text{ in steps of } 0.2.$$

Q6) Fit a binomial distribution to the following data and test for goodness of fit at the level of significance 0.05 :

x :	0	1	2	3	4	5
y :	38	144	342	287	164	25

SECTION-C

Q7) Obtain the Fourier series for the function $f(x) = |\sin x|$, $-\pi < x < \pi$.

Q8) Solve the PDE $x^2(z-y)p + y^2(x-z)q = z^2(y-x)$.

Q9) If $f(z)$ is a regular function of z , prove that, $\left(\frac{\partial^2}{\partial x^2} + \frac{\partial^2}{\partial y^2} \right) |f(z)|^2 = 4 |f'(z)|^2$.