

SECTION-B

- 2 Find a Fourier series to represent the function defined by,

$$f(x) = x + x^2 \text{ for } -\pi < x < \pi.$$

- 3 Find, $L\left[\frac{e^{5t} - \sin 2t}{t}\right]$

- 4 Solve the partial differential equation,

$$p \cos (x + y) + q \sin (x + y) = z$$

- 5 Solve $\frac{dy}{dx} = x + y$, $y(0) = 1$ in the range $0 \leq x \leq 0.2$ using Modified Euler's method.

- 6 Assuming that the height distribution of a group of men is normal, find the mean and standard deviation, if 84% of men have heights less than 65.2 inches 68% have height lying between 65.2 and 62.8 inches.

SECTION-C

- 7 Prove that the function $z \bar{z}$ is continuous everywhere but nowhere differentiable except at origin.

- 8 Suppose that 100 tyres made by a certain manufacturer lasted on the average 21,819 miles with a certain standard deviation of 1295 miles. Test the null hypothesis $\mu = 2,000$ miles against the alternative hypothesis $\mu < 22,000$ miles at the 0.05 level of significance.

- 9 Apply Gauss - Jordan method to solve the equations,

$$x + y + z = 9, 2x - 3y + 4z = 13, 3x + 4y + 5z = 40.$$