

UNIT - IV

- 4 (a) If $f(t) = \frac{t}{a}$ for $t < a$
 $= 1$ for $t > a$

show that :

$$Lf(t) = \frac{1 - e^{-as}}{as^2}$$

- (b) Find the inverse Laplace transform of

$$\frac{s+2}{s^2 - 4s + 13}$$

OR

- 4 (a) Solve the equation by Laplace transform of
 $(D-1)(D-2)(D-3)x = 5$, when $x=0$ $x'=0$ $x''=0$.
 (b) Solve the following equation by Laplace transform :

$$\frac{dx}{dt} - 2x = 3e^t \text{ given } x(0) = 1.$$

UNIT - V

- 5 (a) Find the missing term of the following distribution :

x	0	1	2	3	4
y	$y_0 = 1$	$y_1 = 8$?	$y_3 = 64$	$y_4 = 125$

- (b) Apply Picards method of find the solution of $\frac{dy}{dx} = y - x$ with
 $x_0 = 0, y_0 = 2$ upto the third order approximation.

OR

- 5 (a) Apply Miline's predictor-corrector method to solve the following differential equation :

$$\frac{dy}{dx} = x - y^2, \text{ given that } \begin{array}{|l|l|} \hline y(0) = 0 & y(.2) = .02 \\ \hline y(.4) = .0795 & y(.6) = .1762 \\ \hline \end{array}$$

- (b) Use Runge-Kutta forth order method to solve $\frac{dy}{dx} = -2xy^2$,
 $y(0) = 1$ with $h = 0.2$ for $x = 0.2$.

