# St. Francis Institute of Technology

## Inverse Laplace Transform (Practice Questions)

### 02 Marks Questions

1. Find $L^{-1}\left[\frac{s+5}{s^2-25}\right]$
2. Find $L^{-1}\left[\frac{3+2s+s^2}{s^3}\right]$
3. Find $L^{-1}\left[\frac{1}{s}+\frac{1}{(s+2)^2}\right]$
4. Find $L^{-1}\left[\frac{1}{(s-2)^2-1}\right]$
5. Find $L^{-1}\left[\frac{1}{(s-a)(s-b)}\right]$
6. Find $L^{-1}\left[\frac{s-2}{s^2-4s+13}\right]$
7. Find $L^{-1}\left[\frac{e^{-3s}}{s^2-4s+5}\right]$

### 05 Marks Questions

1. Find Inverse Laplace Transform of $\frac{4s+12}{s^2+8s+12}$
2. Find Inverse Laplace Transform of $\frac{(s+2)}{(s+1)^2(s+3)}$
3. Find Inverse Laplace Transform of $\frac{s}{(s^2+4)(s^2+1)}$
4. Evaluate Inverse Laplace Transform using convolution theorem

   $$\frac{s}{(s^2+a^2)^2}$$
5. Evaluate Inverse Laplace Transform using convolution theorem

   $$\frac{(s+3)^2}{(s^2+6s+18)^2}$$
6. Evaluate Inverse Laplace Transform of (i) $\tan^{-1}\left(\frac{s}{2}\right)$ (ii) $\log\left(\frac{s^2+4}{s^2+1}\right)$
7. Using convolution theorem prove that

   $$L^{-1}\left[\frac{1}{s}\log\left(\frac{s+a}{s+b}\right)\right]=\int_0^t\frac{e^{-bu}-e^{-au}}{u}$$
8. Find (i) $L^{-1}\left[\frac{1}{s\,(s^2+9)}\right]$ (ii) $L^{-1}\left[\frac{1}{s}\log\left(\frac{s+2}{s+1}\right)\right]$