Math 301-142 Quiz 4

Name:.....Sec#:.....ID#:.....Ser#:.....

Q:1 (3 points) Find the Laplace transforms:

(a) $\mathcal{L}\{te^{-2t}\sin 3t\}$

(b) $\mathcal{L}\left\{\int_0^t e^{\tau}\cos 2(t-\tau)d\tau\right\}$

Q:2 (4 points) Solve the differential equation $y'' + 16y = f(t)$ with $y(0) = 0$ and $y'(0) = 1$

and $f(t) = \begin{cases} \cos 4t, & 0 \le t < \pi \\ 0, & t > \pi \end{cases}$

Q:3 (4 points) Solve the integral equation $f(t) + 2\int_0^t f(\tau)\cos(t-\tau)d\tau = 4e^{-t} + \sin t$.

Q:4 (4 points) Solve the differential equation $y'' + 4y' + 13y = \delta(t-\pi) + \delta(t-3\pi)$

with $y(0) = 1$ and $y'(0) = 0$.