FREMCH ERERE CIULL ENIGINEERING
L6 LENCGOS 1059
ENGG 381

1) $\frac{d \cdot 2 y}{d \theta^{2}}+\frac{d y}{d \theta}+5 y=6 \sin \theta$

$$
\begin{aligned}
& \text { C. F } \\
& m^{2}+4 m+5-0 \\
& -6 \pm \frac{\sqrt{b^{2}-4 a c}}{2 a}=m \\
& -4 \pm \frac{ \pm \sqrt{4^{2}-4(1)(5)}}{2(1)}=m \\
& =\frac{-4 \pm \sqrt{16-20}}{2} \\
& \frac{-4}{2} \pm \frac{\sqrt{-4}}{2} \\
& -2 \pm \frac{j_{2}}{2} \\
& m=-2 \pm j \\
& y=e^{-2 \theta} \quad(A \cos \theta+B \sin \theta) \\
& p=1 \\
& y=C \sin \theta+D \cos \theta \\
& \frac{d y}{d x}=C \cos \theta-D \sin \theta \\
& \frac{d^{2} y}{d x^{2}}=-C \sin \theta-D \cos \theta \\
& =C(\sin \theta-D \cos \theta+4 C \cos \theta-D \sin \theta)+5(C \sin \theta+D \cos \theta) \\
& =6 \sin \theta \\
& -a \sin \theta-x \cos \theta+4 c \cos \theta-40 \sin \theta+5 \cos \theta+50 \cos \theta \\
& =6 \sin \theta
\end{aligned}
$$

compaing wefficient

$$
\begin{gather*}
-C-4 D+5 C=6 \\
-D+4 C+5 D=0  \tag{11}\\
4 C-4 D=6 \\
4 D+4 C=0 \\
0-8 D=6 \\
D=\frac{-6}{8}=-3 / 4
\end{gather*}
$$

$$
\begin{gathered}
\frac{-4 \pm \sqrt{16}}{2}-20 \\
\frac{-4 \pm \sqrt{-4}}{2} \\
-2+j
\end{gathered}
$$

$2 E I \frac{d^{2} y}{d x^{2}}=\frac{\omega}{2}(L-x)^{2}$
solutun

$$
\begin{aligned}
& C F \\
& E=I m^{2}=0 \\
& m^{2}=0 \\
& m=\sqrt{0} \\
& m=0 \\
& y=e^{0 x}(A+B x) \\
& y=A+B x
\end{aligned}
$$

$$
\begin{aligned}
& \text { P. I } \\
& y=G x^{2}+t l x^{3}+2 x^{4} \\
& \frac{d y}{d x}=2 G x+3 H x^{2}+4 z x^{3} \\
& \frac{d^{2} y}{d x^{2}}=2 G+6 H x+R 2 x^{2} \\
& \text { EI }\left(2 G+6 H x+12\left(x^{2}\right)=\frac{w}{2} C_{L}-x\right)^{2}
\end{aligned}
$$

$$
\begin{gathered}
\frac{-4 \pm \sqrt{16}-20}{2} \\
\frac{-4 \pm \sqrt{-4}}{2} \\
-2+j
\end{gathered}
$$

$2 E I \frac{d^{2} y}{d x^{2}}=\frac{1}{2}(1-x)^{2}$
solutun

$$
\begin{aligned}
& C F \\
& E I m^{2}=0 \\
& m^{2}=0 \\
& m=\sqrt{0} \\
& m=0 \\
& y=e^{0 x}(A+B x) \\
& y=1+B x
\end{aligned}
$$

P.I

$$
\begin{aligned}
& y=G x^{2}+t l x^{3}+z x^{4} \\
& \frac{d y}{d x}=2 G x+3+b x^{2}+4 z x^{3} \\
& \frac{d^{2} y}{\partial x^{2}}=2 G+6+H x+R z x^{2} \\
& \left.E I\left(2 G+6 H x+12 z x^{2}\right)=\frac{w}{2} C_{L-x}\right)^{2} \\
& 2 G E I+6 H x E I+12 Z x^{2} E I=\frac{\omega}{2} C\left(L^{2}-2 w c+x^{2}\right)
\end{aligned}
$$

$$
\begin{aligned}
& y=\frac{10}{24 E I}\left(6 L^{2} x^{2}-4 L x^{3}+x^{4}\right) \\
& G \cdot 5 \\
& y=A+B x+\frac{10}{24 E I}\left(6 L^{2} x^{2}-4 L x^{3}+x^{4}\right)
\end{aligned}
$$

at $y=0, x=0 \quad \frac{d y}{d x}=0$

$$
\begin{aligned}
& \left.0=A+B C O)+\frac{\omega}{24 \in I}\left(b L^{2} C_{D}\right)^{2}-4(C O)^{3}+0^{4}\right) \\
& 0=A \\
& A=0 \\
& \frac{d y}{d x}=B+\frac{10}{24 \in I}\left(12 \nu^{3} x-12\left(x^{2}+4 x^{3}\right)\right. \\
& D F B+w \quad\left(R^{2}(D)-12\left[(D)^{2}+4(0)\right]\right.
\end{aligned}
$$

$$
\begin{aligned}
& y=\frac{\omega}{24 \epsilon I}\left(6 l^{2} x^{2}-4\left(x^{3}+x^{4}\right)\right. \\
& y=\frac{\omega}{24 E I} x^{2}\left(6 l^{2}-4 l x+x^{2}\right) \\
& x=\frac{L}{2} \\
& y=\frac{w l^{2}}{24 E I}\left(6 l^{2}-4 L^{2}+l^{2}\right) \\
& y=\frac{10 l^{2}}{24 E I}\left(3 l^{2}\right) \\
& y=\frac{3 w l^{4}}{24 E I} \\
& y=\frac{10 l^{4}}{8 E I}
\end{aligned}
$$

