1. 解 $y''-3y'+2y=e^{-3t}$， $y(0)=0$， $y'(0)=1$.

〈解〉 $[s^2Y(s)-sy(0)-y'(0)]-3[sY(s)-y(0)]+2Y(s)=\dfrac{1}{s+3}$

$$[s^2Y(s)-s\times 0-1]-3[sY(s)-0]+2Y(s)=\frac{1}{s+3}$$

$$(s^2-3s+2)Y(s)=1+\frac{1}{s+3}$$

$$Y(s)=\frac{s+4}{(s+3)(s^2-3s+2)}$$

$$=\frac{s+4}{(s-1)(s-2)(s+3)}$$

$$=\frac{A}{s-1}+\frac{B}{s-2}+\frac{C}{s+3}$$

$$=\frac{A(s-2)(s+3)+B(s-1)(s+3)+C(s-1)(s-2)}{(s-1)(s-2)(s+3)}$$

$$s+4=A(s-2)(s+3)+B(s-1)(s+3)+C(s-1)(s-2)$$

令 $s=1$ $\quad A(1-2)(1+3)=1+4 \quad A=-\dfrac{5}{4}$

令 $s=2$ $\quad B(2-1)(2+3)=2+4 \quad B=1$

令 $s=-3$ $\quad C(-3-1)(-3-2)=-3+4 \quad C=\dfrac{1}{20}$

$$Y(s)=-\frac{5}{4}\frac{1}{s-1}+\frac{1}{s-2}+\frac{1}{20}\frac{1}{s+3}$$

$$y(t)=-\frac{5}{4}e^{t}+e^{2t}+\frac{1}{20}e^{-3t}$$