

國立臺灣科技大學

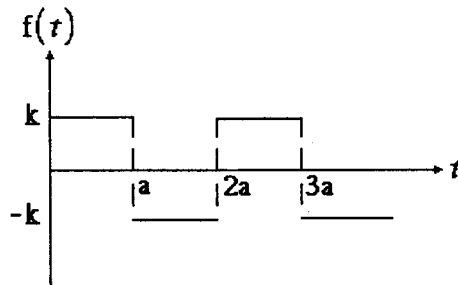
九十四學年度碩士班招生考試試題

系所組別：高分子工程系碩士班丙組

科目：工程數學

總分 100 分

1. Solve the differential equation:  $y(t) = t - \int_0^t y(\tau) \sinh d\tau$ . (15%)
2. Find the Laplace transform of the following periodic square wave ( $P = 2a$ ). (15%)



3. Solve  $y'' + 5y' + 6y = f(t)$   $y(0) = y'(0) = 0$  (15%)

$$\text{where } f(t) = \begin{cases} t & 0 \leq t < 1 \\ 1 & 1 \leq t < 2 \\ 3-t & 2 \leq t < 3 \\ 0 & t \geq 3 \end{cases}$$

4. Solve  $(x^2 - 2x)y'' + 2(1-x)y' + 2y = 6(x^2 - 2x)^2$  (20%)

5. Solve the differential equation  $y'' - 4y' + 4y = (x+1)e^{2x}$  (15%)

6. Solve the differential equation.  $y' + y = f(t)$ ,  $y(0) = 5$  (20%)

$$\text{where } f(t) = \begin{cases} 0, & 0 \leq t < \pi \\ 3 \cos t, & t \geq \pi \end{cases}$$

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