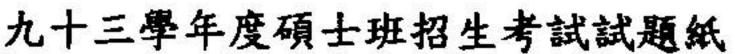
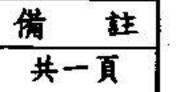
臺中健康暨管理學院



系 所 別	組別	考試科目	考試日期	時	間	備	註	35000
多媒體遊戲設計研究所碩士班		工程數學	93.5.3	10:30-12:10		共一頁		



- Find the general solution of the following equations.
 - (a) y' = 3(y+1) (8%)
 - (b) $x^2y' = y^2 + xy + x^2$ (8%)
- 2. Solve the initial value problem y'' y' 6y = 0, y(0) = 5, y'(0) = -5. (10%)

$$y'' - y' - 6y = 0$$

$$\nu(0) = 5$$
.

$$y'(0) = -5.$$
 (10%)

3. (a) Find the Laplace transform of the function

$$f(t) = \frac{b}{a}t$$

$$f(t) = \frac{b}{a}t \qquad \text{if } 0 < t < a,$$

$$f(t+a) = f(t)$$
 . (10%)

$$(10\%)$$

(b) Find the inverse Laplace transform f(t) of

$$F(s) = \frac{s}{(s+3)^2 + 1}.$$
 (10%)

- 4. What is a symmetric matrix? Orthogonal matrix? Give an example for each case.
- 5. Find the rank of the matrix $\begin{bmatrix} 0 & 5 & 8 \\ -3 & 4 & 4 \end{bmatrix}$
- 6. For the matrix $\begin{bmatrix} -5 & 2 \\ -9 & 6 \end{bmatrix}$
 - (a) Find the eigenvalues and eigenvectors.
 - (b) Diagonalize the matrix.
- 7. Three boxes contain five balls each, numbered from 1 to 5, and one ball is drawn from each box. Find the possibility of the event E that the sum of the numbers on the drawn balls is greater than 4. (10%)
- 8. Let X have the density f(x) = 2x if $0 \le x \le 1$ and 0 otherwise. Show that X has the mean $\frac{2}{3}$ and the variance $\frac{1}{18}$. (10%)

