所別	科目	准考證號碼 (請考生填入)	考試日期	節次	第1頁/共1頁
電子工程研究所	工程數學		95年5月7日	第二節	

1. Solve $y'' - 2y' + y = e^x$ (10%)

2. Find the Fourier transform of cos t . (10%)

3. Find the inverse Laplace transform of $\dfrac{1}{(S+1)^3}$ (10%)

4. $A = xy\vec{i} + yz\vec{j} + zx\vec{k}$. Solve $\nabla \cdot A$ and $\nabla \times A$. (20%)

5. With Euler equation, please solve $x^2 y'' + 2xy' - 6y = 0$ (10%)

6. If f(t)= at- sin(at) where a is a constant, calculate the Laplace transform, F(s) = ? (10%)

7. Diagonalize the matrix A, $A = \begin{pmatrix} -1 & 4 \\ 0 & 3 \end{pmatrix}$ (10%)

8. Solve a 2x2 system,
$$x_1' = 3x_1 + 3x_2 + 8$$
$$x_2' = x_1 + 5x_2 + 4e^{3t}$$
(20%)