國立中興大學106學年度碩士班招生考試試題

科目：工程數學　　系所：土木工程學系丙組

本科目可以使用計算機　　本科目試題共 1 頁

1. Find the general solution to $y' + y = x e^{-x}$ (10%)

2. Solve the set of differential equations
   $y + 2dx/dt - 3x = 0$
   $2\ dy/dt - 3y + x = 4 e^{t}$ (10%)

3. Please theory of residues to find the value of $\int_0^{\infty}[\frac{2x^2+1}{x^4+5x^2+4}]dx$ (20%)

4. Find the Plane C which crosses point P (2,1,4) and the intersection of Plane A (x-y+z=1) and Plane B (x+2y-3z=0). (20%)

5. Use the Laplace Transformation to solve the boundary value problem
   $y''+2y'+y=0$, $y(0)=0$, $y(1)=2$ (20%)

6. Please find the principal stresses σ_1, σ_2, σ_3 and their orientations to a stress state $\sigma_{xx} = \sigma_{yy} = \sigma_{zz} = 60$MPa, $\sigma_{xy} = \sigma_{yx} = 20$MPa, $\sigma_{xz} = \sigma_{zx} = \sigma_{yz} = \sigma_{zy} = 0$.
   (20%)