

# 國立中山大學 101 學年度碩士暨碩士專班招生考試試題

科目：工程數學【環工所碩士班甲組、乙組】

題號：4074  
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一、Solve the differential equation  $y' = -\frac{2x}{y}$  (20%)

二、Show the following equation is exact and solve it  $3x^2ydx + x^3dy = 0$   
(20%)

三、Solve  $y(x^2y^2 + 2)dx + x(2 - 2x^2y^2)dy = 0$  (10%)

四、Please solve the following differential equation: (20%)

$$y'' - 2y' + y = \frac{e^x}{2x}$$

五、After taking the Laplace transformation,  $y(t)$  is transformed to the following equation. What is  $y(t)$ ? (30%)

$$\frac{s+1}{s^2+s-6}$$