

# 國立中山大學 102 學年度碩士暨碩士專班招生考試試題

科目名稱：工程數學【環工所碩士班甲組、乙組】

題號：433001

※本科目依簡章規定「可以」使用計算機（廠牌、功能不拘）

共 1 頁 第 1 頁

一、Determine the general solution of the following ordinary differential equation.

$$4(y')^2 + x y^2 = 2y^2 y' + x y' \quad (15\%)$$

二、Determine the general solution of the following equation.  $3 y'' + 2 y' + y = 0$ . (15%)

三、The point A (x, y, z) is on the given plane  $x + 2y + 3z = 4$ . Determine the shortest distance of point A to the given plane if point is close to the point B (2, 3, -4) (20%)

四、Please find derivatives of the following: (30%)

(a)

$$y = 2^x$$

(b)

$$y = 2^{\sqrt{x}}$$

(c)

$$y = \log_{10} \cos x$$

五、Please find the Fourier series of the following: (20%)

$$f(x) = |\cos 2x|$$

