淡江大學98學年度進修學士班轉學生招生考試試題

系別：電機工程學系三年級　　科目：工 程 數 學

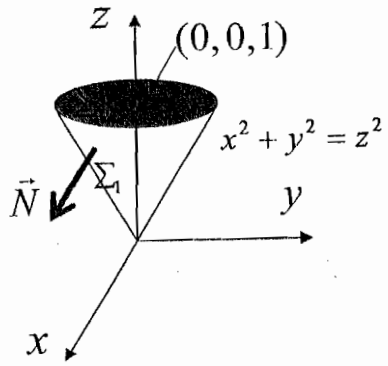
准帶項目請打「V」	
	計 算 機

本試題共 5 大題，1 頁

1.(20%) Find the general solution of $x^2y'' + 2xy' - 6y = 0$.

2. (20%) Let $\Lambda = \begin{pmatrix} 1 & -1 & 0 \\ 0 & 1 & 1 \\ 0 & 0 & -1 \end{pmatrix}$ find eigenvectors and eigenvalues of Λ

3. (20%) $\sum: \begin{cases} \sum_1 : z = \sqrt{x^2 + y^2}, x + y \le 1 \\ \sum_2 : x + y \le 1, z = 1 \end{cases}$



$\vec{F} = x\vec{i} + y\vec{j} + z\vec{k}$

(i) $\iint_{\Sigma} \vec{F} \cdot \vec{N} d\sigma = ?$

(ii) $\iiint_{M} \nabla \cdot \vec{F} dV = ?$

4. (20%)Let $f(x) = x$ for $-\pi \le x \le \pi$. Find the Fourier series of f on $[-\pi, \pi]$.

5. (20%) Let $f(x) = \dfrac{\sin(z)}{z^2(z^2+4)}$ evaluate $\int_{\Gamma} f(z)dz$, where Γ is a closed path enclosing 0 and $2i$ but not $-2i$.