

科目：電磁學

適用：應光系

考生注意：

1. 依次序作答，只要標明題號，不必抄題。
2. 答案必須寫在答案卷上，否則不予計分。
3. 限用藍、黑色筆作答；試題須隨卷繳回。

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1. Convert the following vector  $\mathbf{A} = \hat{a}_x + \hat{a}_y + \hat{a}_z$  to cylindrical coordinates and spherical coordinates. (25%)

2. The electric flux density is  $\mathbf{D} = \frac{1}{R} \hat{a}_R$  in spherical coordinates. Find the total charge within  $R=a$ . (25%)

3. Three point charges, each with charge of  $q$ , are located on the  $x$ -axis at  $x = -d, 0$ , and  $d$  in free space. Please find the electric field intensity at  $x=2d$ . (25%)

4. Please write down the Maxwell's four equations both in integral and differential form. (25%)

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