

科目：電磁學

適用：電機系

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。

本 試 題  
共 / 頁  
第 ( ) 頁

編號：357

1. Find the electric field distribution outside and inside a spherical charge. The volume charge density of the sphere is constant  $\rho$  and the radius of the sphere is  $k$ . (20分)

2. A spherical capacitor consists of an inner conducting sphere of radius  $h$  and an outer conductor with a spherical inner wall of radius  $H$ . The space between the conductors is filled with a dielectric of permittivity  $\epsilon$ . Find the capacitance of the capacitor. (20分)

3. An infinitely long conductor with a circular cross section of radius  $h$  carries a steady current  $I$ . Find the magnetic flux density inside and outside the conductor. (20分)

4. State the meaning of the following terms: (20分)

- (a) Polarization Vector
- (b) Hysteresis Loops

5. State the meaning of the following terms: (20分)

- (a) Electric Dipole
- (b) Magnetic Dipole