

# 國立臺北科技大學 101 學年度碩士班招生考試

系所組別：2230 電腦與通訊研究所丙組

## 第一節 電磁學 試題

第一頁 共一頁

### 注意事項：

1. 本試題共五題，配分共 100 分。
2. 請標明大題、子題編號作答，不必抄題。
3. 全部答案均須在答案卷之答案欄內作答，否則不予計分。

### 一、(20%)

1. Plot the structure of the electric and magnetic dipole.
2. What is the assumption of the structures to calculate the dipole moment?
3. Sketch the electric fields and the magnetic fields of the structures.
4. What is the difference between the electric and magnetic fields?

### 二、(20%)

1. Describe and plot the measurement set-up of Hall Effect.
2. What can we identify from the experiment? Specify it.

### 三、(20%) Considering the system shown in Fig. 1, please find

1. Input impedance at the input end  $d=l$ ,  $Z_{in}(l)$
2. The current  $I_g$
3. The voltage across the input impedance,  $V(l)$
4. The time-average power delivered to the system

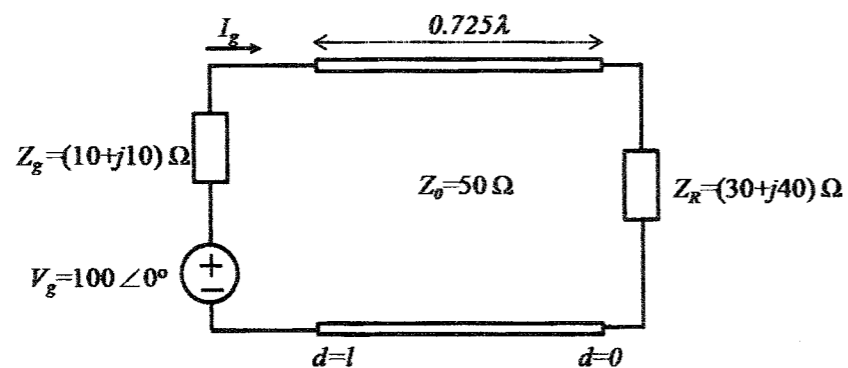


Fig. 1

### 四、(20%)

1. Sketch the lumped equivalent circuit for a lossy transmission line. (5%)
2. Derive the lossy transmission-line equations in phasor. (10%)
3. Derive the characteristic impedance of the lossy line from 2. (5%)

### 五、(20%)

In the system shown in Fig. 2(a), the switch  $S$  is closed at  $t=0$ . The line voltage variations with time at  $z=0$  and  $z=l$  for the first  $5\ \mu\text{s}$  are observed to be as shown in Fig. 2(b) and Fig. 2(c), respectively.

Find the values of  $V_0$ ,  $R_g$ ,  $R_L$ , and  $T$ .

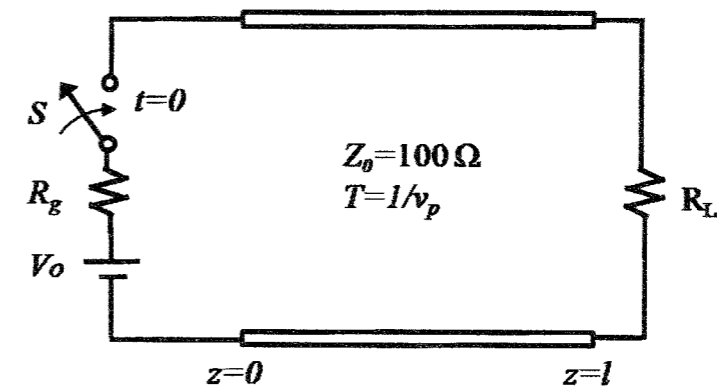


Fig. 2(a)

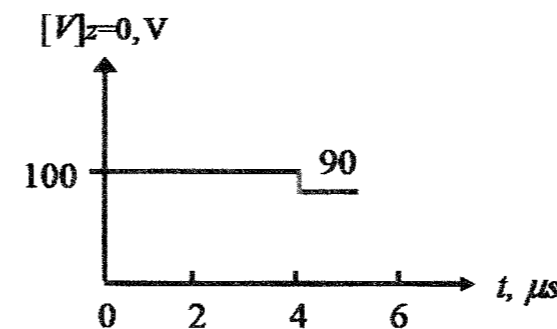


Fig. 2(b)

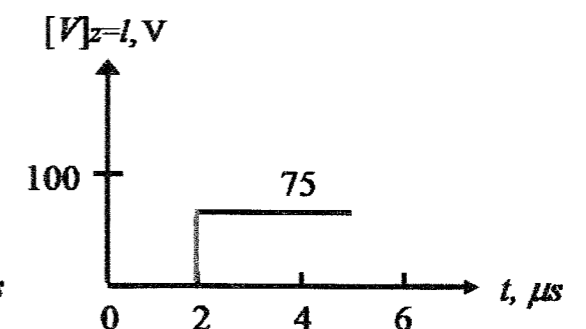


Fig. 2(c)