

國立臺北科技大學  
九十九學年度研究所碩士在職專班入學考試

電機工程系碩士班

乙組：電工原理(含基礎電學及電力電子專業實務)試題

填准考證號碼

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第一頁 共一頁

**注意事項：**

1. 本試題共【6】題，配分共100分。
2. 請按順序標明題號作答，不必抄題。
3. 全部答案均須答在試卷答案欄內，否則不予計分。

1. Please find  $i_1$  and the equivalent resistance between a and b shown in Fig. 1. 20%

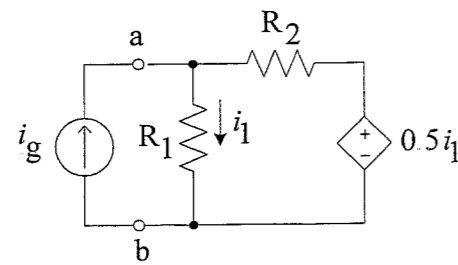


Fig. 1

2. Please analyze the operation of the +12 voltage power supply shown in Fig. 2 connected to a load drawing 400 mA, including the ripple factor of the filter capacitor  $C_1$ , the minimum voltage of  $v_{in}$ , and the efficiency, wherein  $C_1 = 470\mu\text{F}$  and  $C_2 = 0.01\mu\text{F}$ . 15%

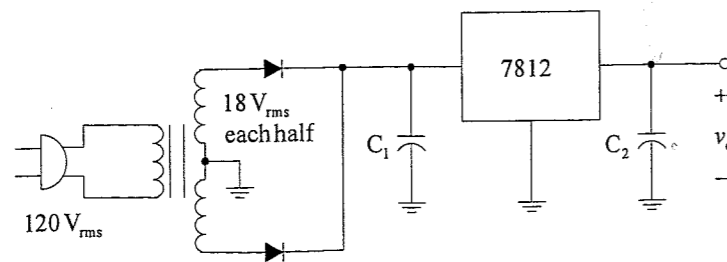


Fig. 2

3. Please draw the source voltage and the source current in the peak-rectifier shown in Fig. 3 and illustrate the factors affecting Power Factor (PF). 15%

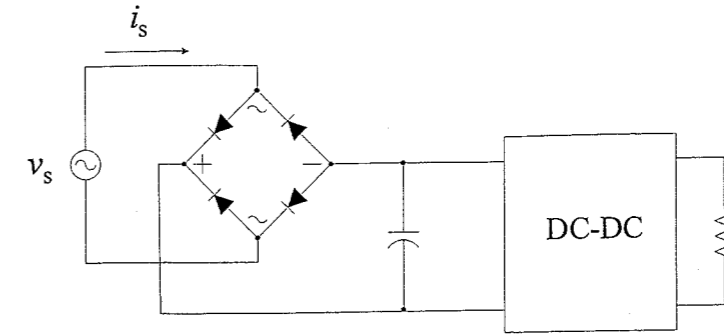


Fig. 3

4. Please illustrate the operations of Flyback converter in CCM, including the original circuit, equivalent circuits, the waveforms on the magnetizing inductor and the voltage ratio. 20%
5. Please explain PWM control and implementation used in power converters. 15%
6. Please briefly and diagrammatically illustrate the differences between the conventional linear power supplies and the switching power supplies. 15%