

國立臺北科技大學  
101 學年度研究所碩士在職專班招生

電機工程系碩士班

戊組：電工原理(含電子學及計算機專業實務)試題

填准考證號碼

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第一頁 共二頁

注意事項：

1. 本試題共【十一】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。

- 一、(a) In the Internet architecture, what is the DNS? (5%)  
(b) Summarize the distinction between cluster computing and grid computing. (5%)

- 二、For the World Wide Web,  
(a) What is a URL? (5%)  
(b) Describe the relationship of browser, user, and hypertext. (5%)

- 三、In C program,  
(a) What is the advantage of using shift operation to replace multiply/Division operation?  
An example is shown in the following. (5%)

```
1. int k = 6;  
2. k = k << 1; // k *= 2;
```

- (b) Can you write a statement to replace line 2 in the following block? The available operators are: <<, >>, (), =, and +. (5%)

```
1. int k = 6;  
2. k = k * 5 / 2;
```

四、How JPEG's baseline standard (also known as JPEG's lossy sequential mode) takes advantage of human eye's limitations to produce compression? (10%)

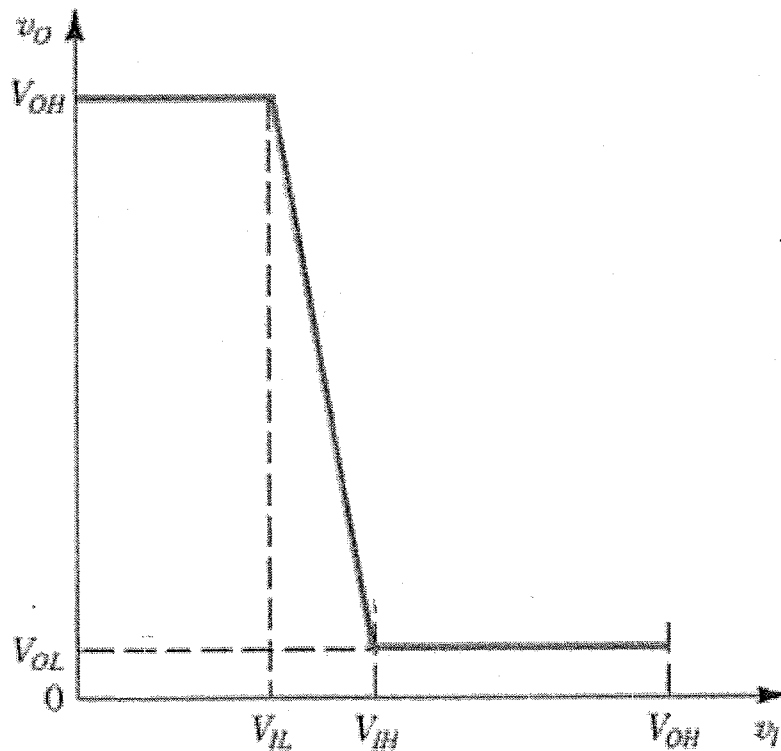
五、In object-oriented programming languages,

(a) What is a constructor? (5%)

(b) Why are some items within a class designated as private? (5%)

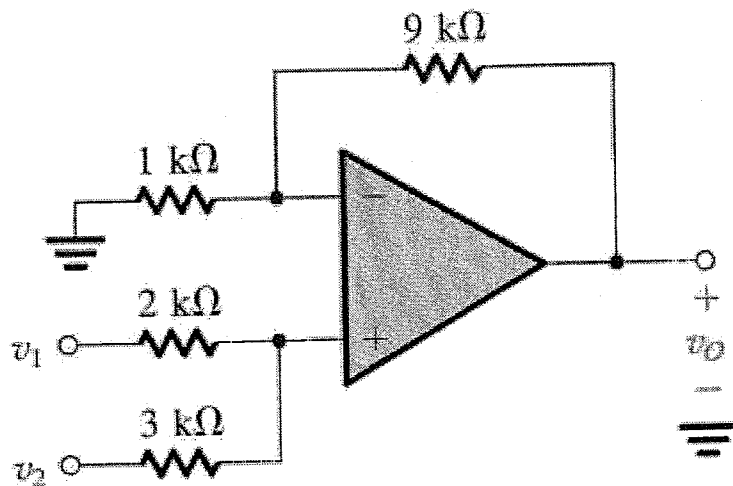
六、What is the amplifier efficiency? Please list it with  $P_{dc}$  (power supply),  $P_I$  (source power),  $P_L$  (load power), and  $P_{diss}$  (power dissipated in amplifier). (5%)

七、For the input-output characteristic of a digital logic inverter as shown in the following figure, please list the noise margin for high input  $NM_H$  and the noise margin for low input  $NM_L$ . (5%)

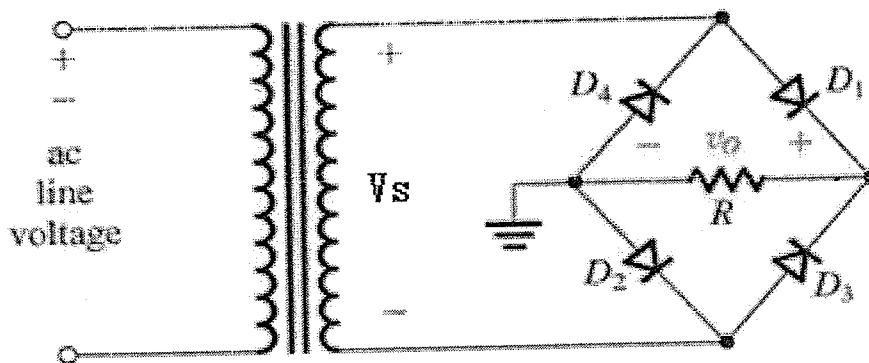


八、Use the superposition principle to find the output voltage of the circuit shown in the following figure. (10%)

注意：背面尚有試題



九、 Find the peak inverse voltage (PIV) in the following bridge rectifier with a diode voltage drop  $V_{D0}$ . (10%)



十、 If an n-channel MOSFET operates in the triode region, calculate the linear resistance  $R_{DS}$  obtained for a device having  $k_n' = 100 \mu\text{A}/\text{V}^2$  and  $W/L = 10$  when operated with an overdrive voltage  $V_{OV}$  of 0.5 V. (10%)

十一、 For a BJT,

(1). Please list 4 possible operation modes. (5%)

(2). In the 4 possible operation modes, please point out its operational status (Forward or Reverse) in the two junctions (EBJ and CBJ). (5%)