Quiz 09 IR Transmitter and Receiver

總分 100/100

NCTU EELAB Fall

區段分數 0/0

Class *

- ○ DEE222
- ◉ DEE320

Student ID *

0710175

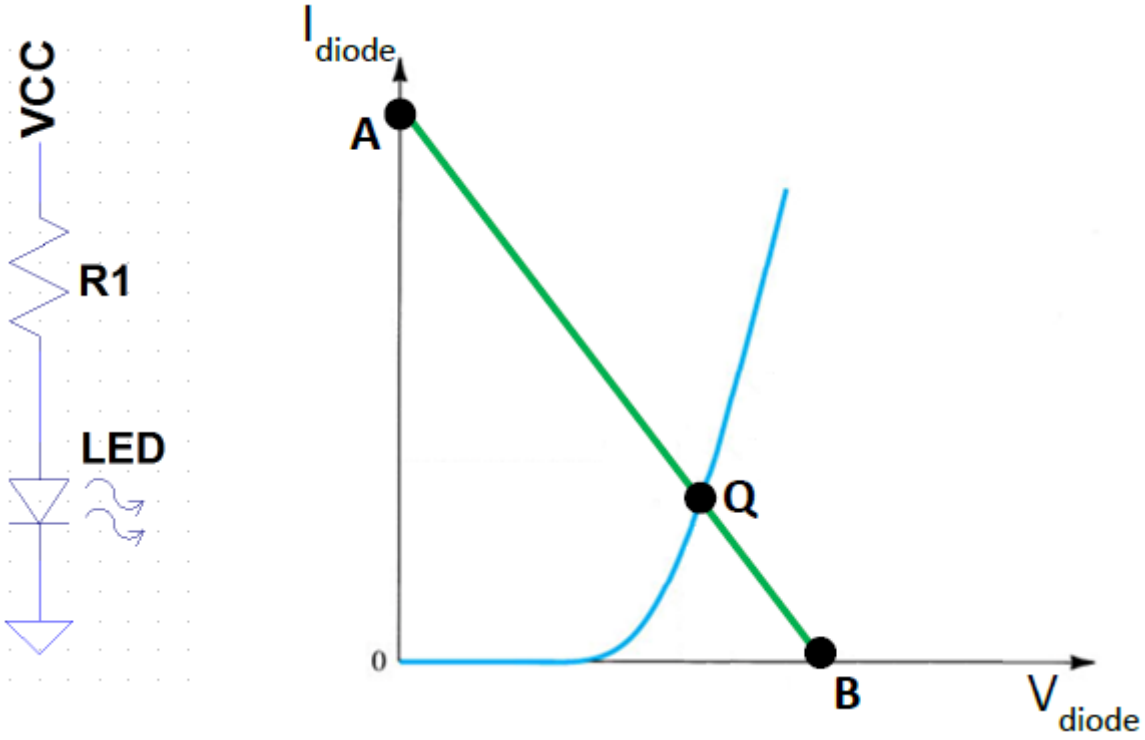
Name *

陳愉方

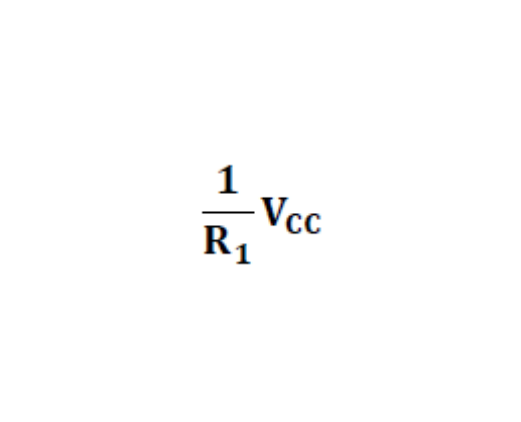
Q1. Look at the figures below, answer the following questions about load line.

區段分數 20/20

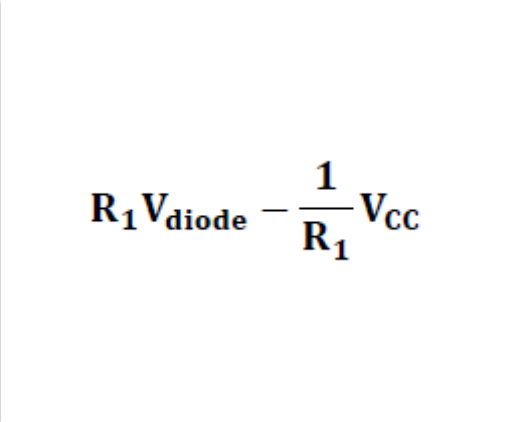
HINT : Apply KVL, VCC=Idiode*R1+Vdiode



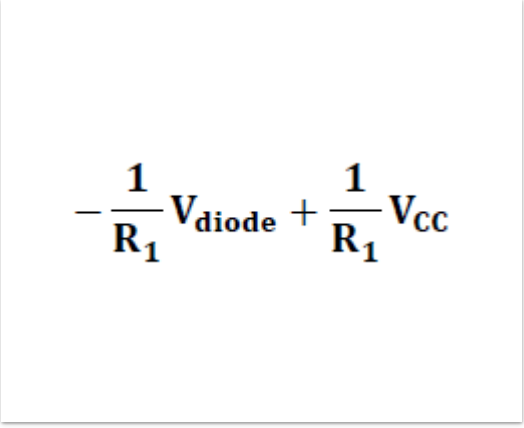
✓ Idiode = ? * 5/5



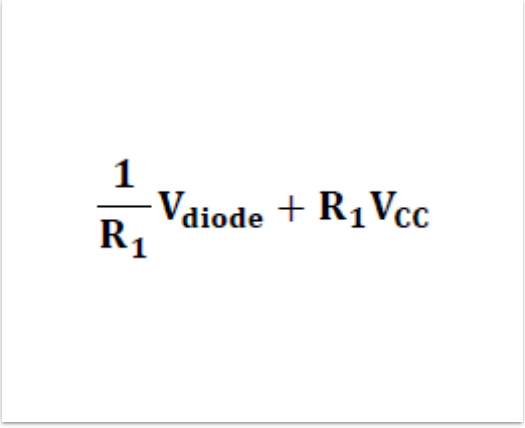
○ 選項 1



○ 選項 2

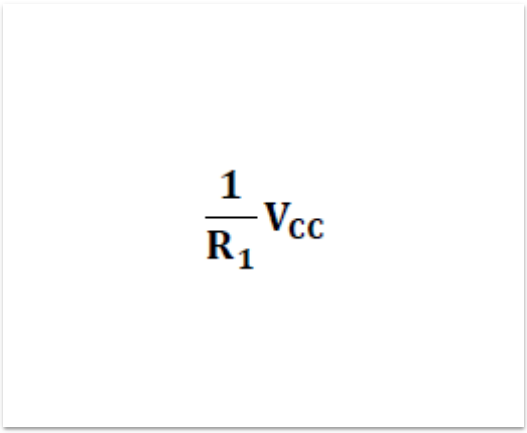


◉ 選項 3 ✓

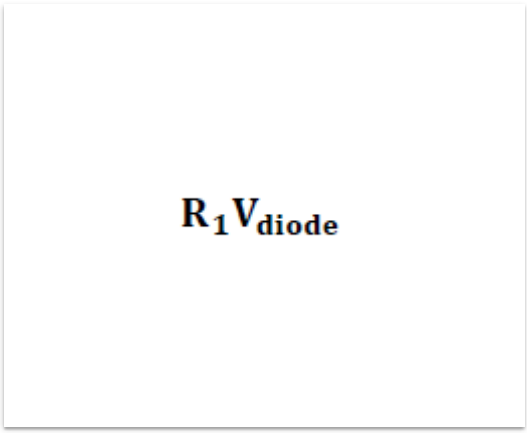


○ 選項 4

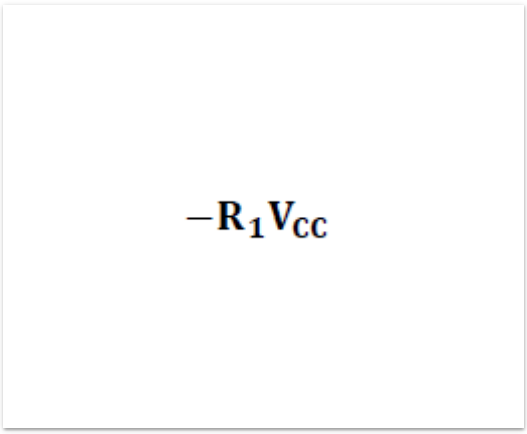
✓ point A = ? * 5/5



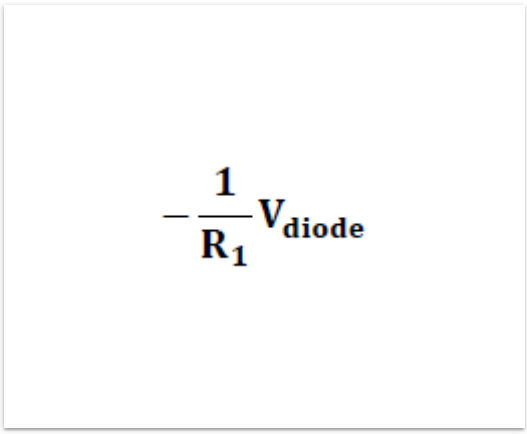
◉ 選項 1 ✓



○ 選項 2

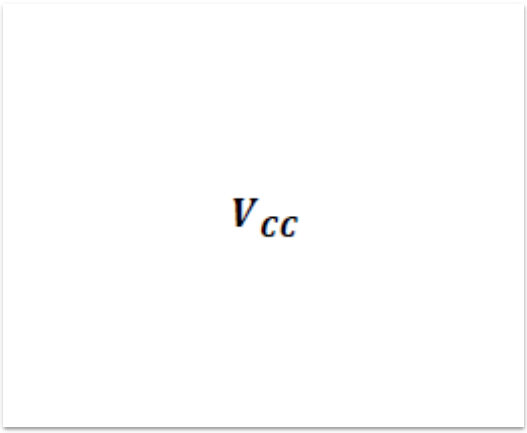


○ 選項 3

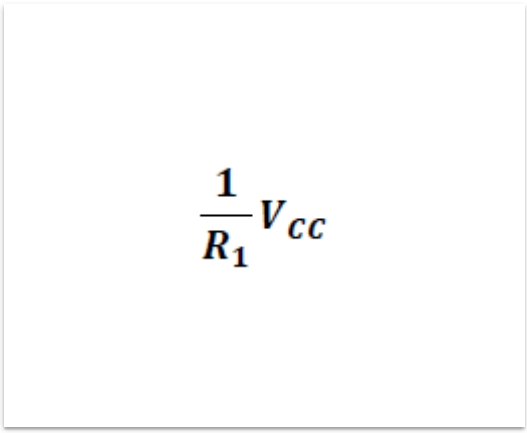


○ 選項 4

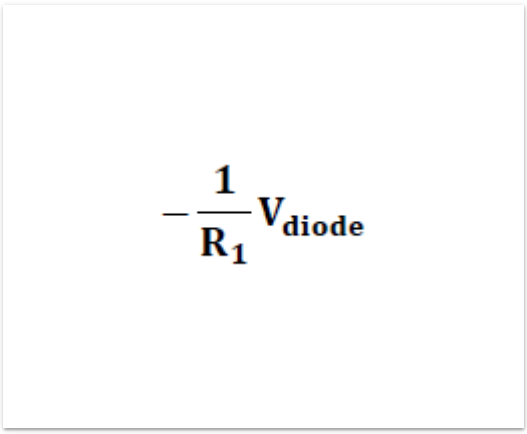
✓ point B = ? * 5/5



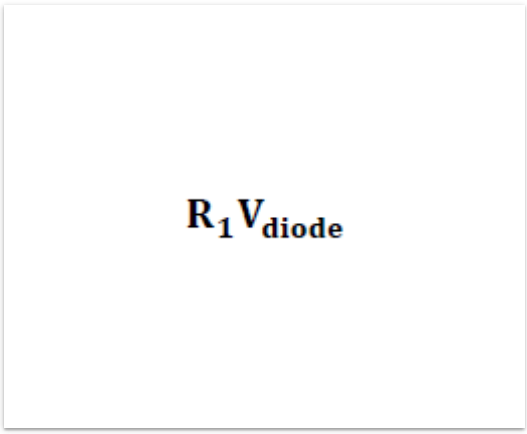
◉ 選項 1 ✓



○ 選項 2



○ 選項 3



○ 選項 4

✓ point Q is usually called ? *multi-choice * 5/5

☐ saturation point

☑ bias point ✓

☐ amplification point

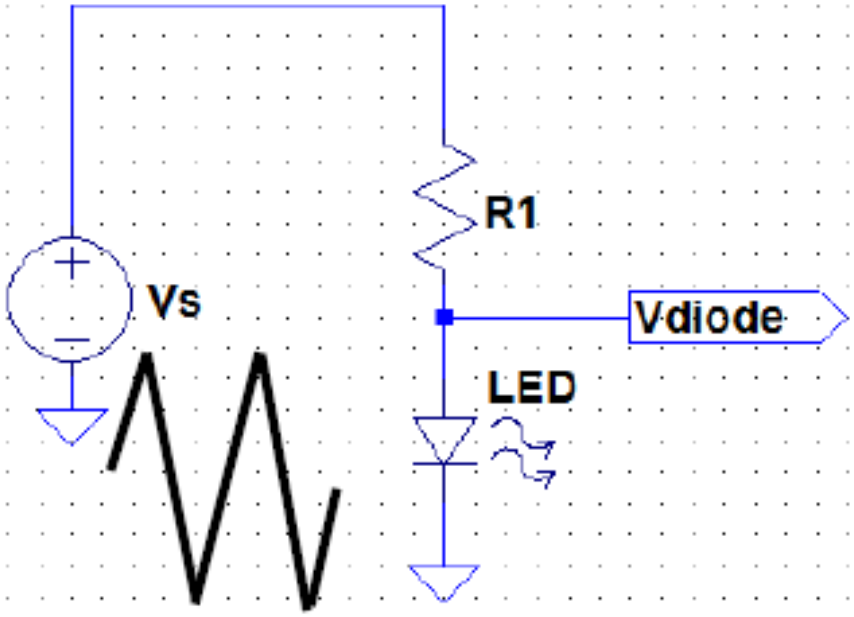
☑ operation point ✓

Q2. Look at the figures below, answer the following questions

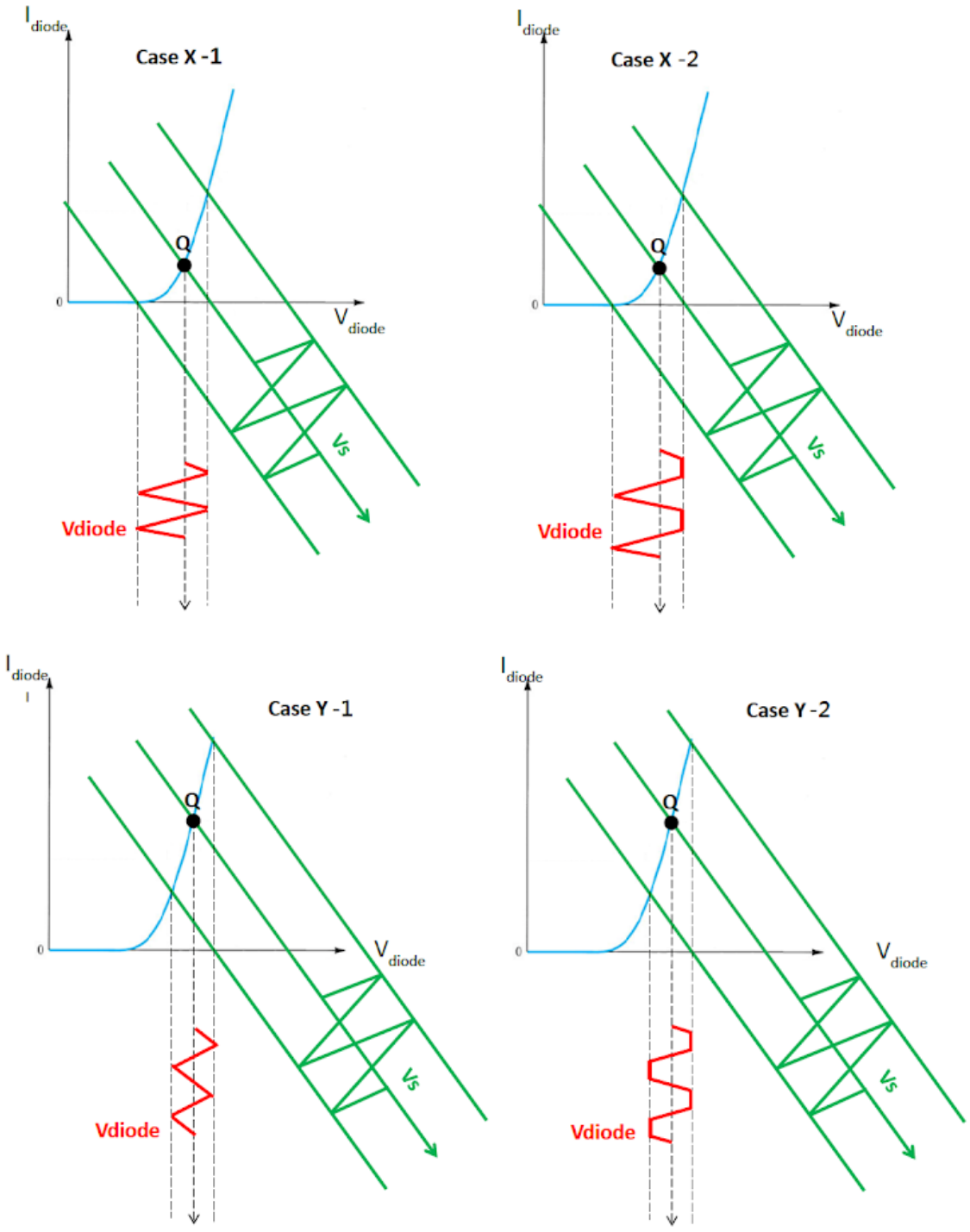
about operation point.

區段分數 40/40

Circuit



✓ Choose the most possible Vdiode waveform about different cases of operation point. *multi-choice * 30/30



- [ ] Case X -1
- [x] Case X -2 ✓
- [x] Case Y -1 ✓
- [ ] Case Y -2

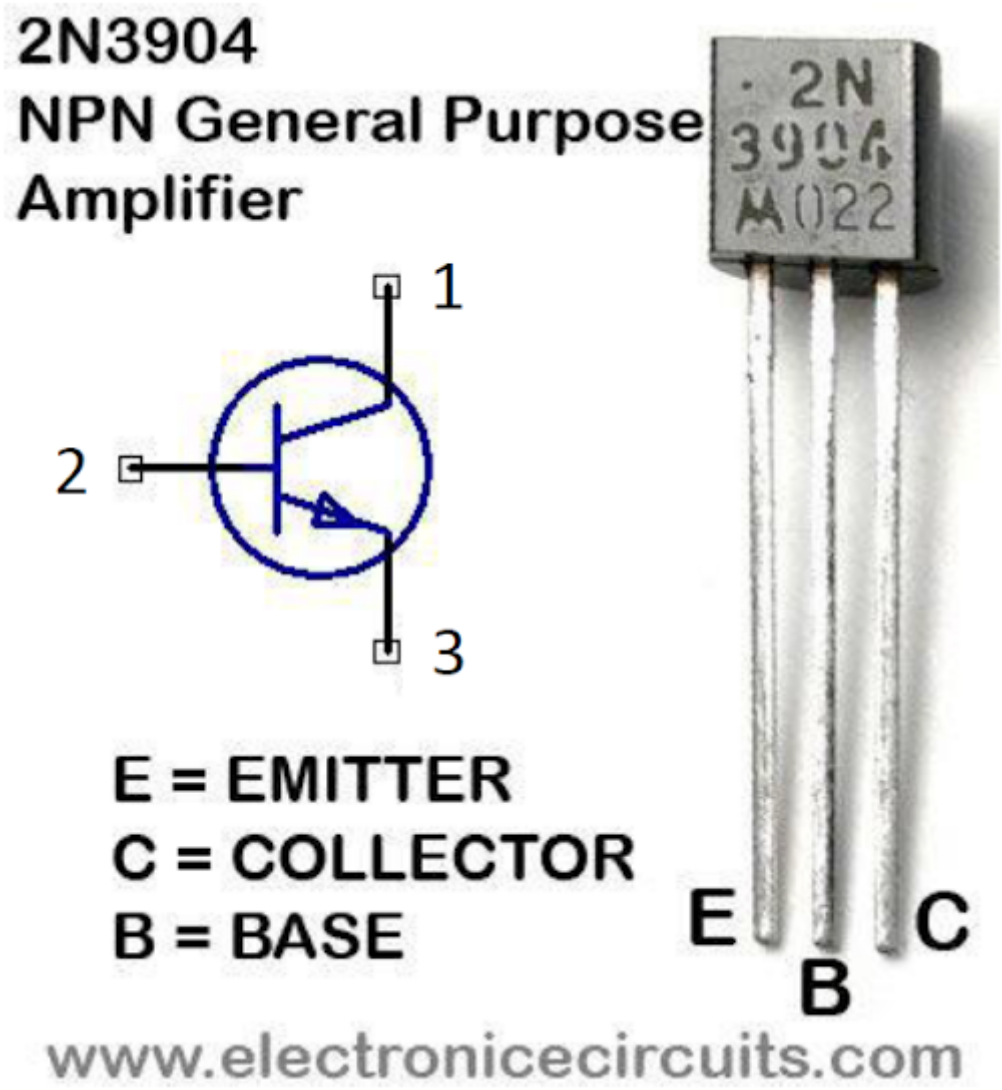
✓ which case could be considered as a "good operation point?" * 10/10

- ○ Case X
- ◉ Case Y ✓

Q3. NPN BJT 3904.

區段分數 10/10

✓ Match pins of NPN BJT 3904. * 10/10

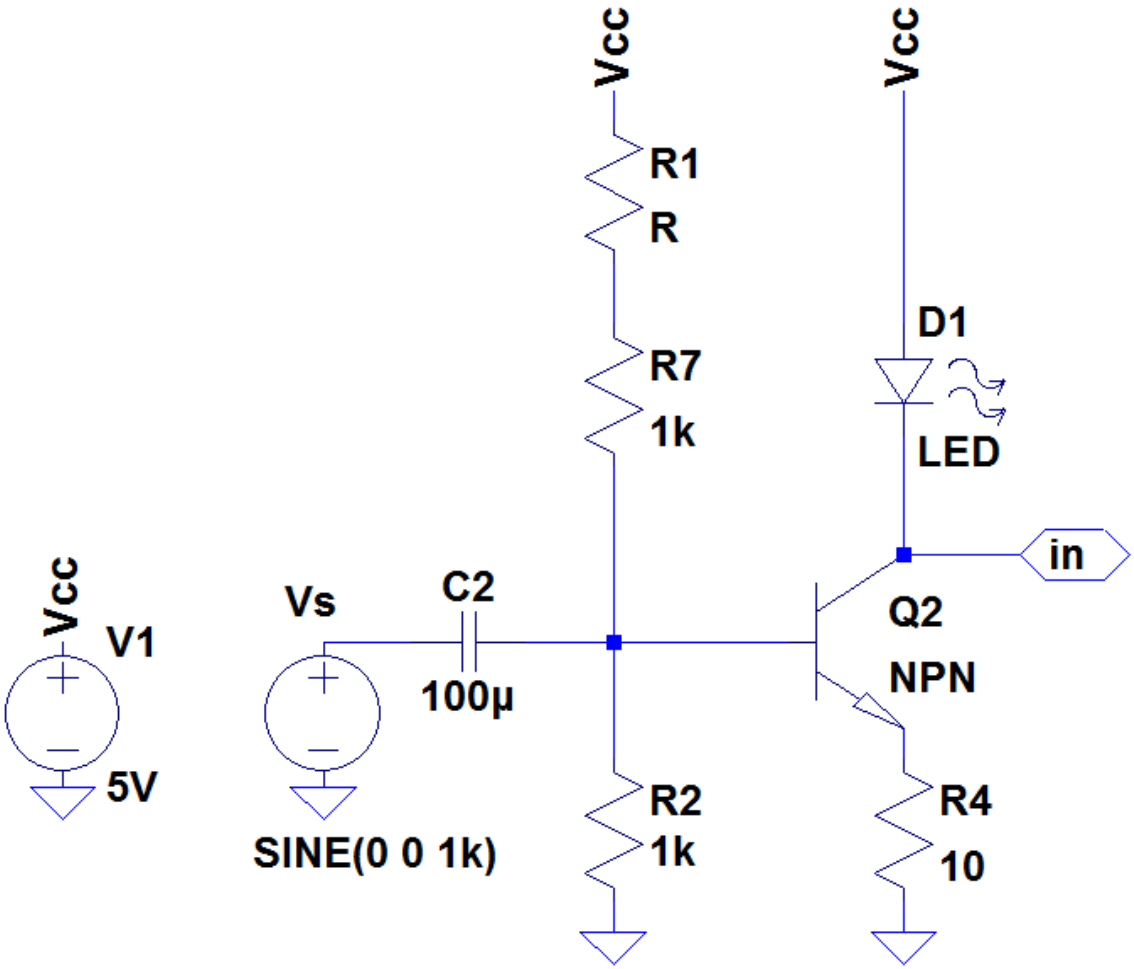


- (E,B,C) = (1,2,3)
- (E,B,C) = (3,2,1) ✓
- (E,B,C) = (2,1,3)
- (E,B,C) = (3,1,2)
- (E,B,C) = (1,3,2)

Q4. Look at the CE circuit below, follow the steps and derive R1.

區段分數 30/30

Design conditions： VE=0.5V, β=200



✓ IC = ? * 5/5

$Step1.\ I_C \cong I_E = ?$

- 0.5 A
- 0.05 A ✓
- 0.005 A

✓ IB = ? * 5/5

$$Step2.\ \mathrm{I_B} = \frac{I_C}{\beta} = ?$$

- 2.5 mA
- 0.025 A
- 0.25 mA ✓

✓ VB = ? * 5/5

$$Step3.\ \mathrm{V_B} = V_E + 0.7V = ?$$

- 0.7 V
- 0.5 V
- 1.2 V ✓

✓ IR2 = ? * 5/5

$$Step4.\ \mathrm{I_{R2}} = \frac{V_B}{R_2} = ?$$

- 0.7 A
- 0.05 A
- 1.2 mA ✓

✓ IR1 = ? * 5/5

$$Step5.\ \mathrm{I_{R1}} = I_B + I_{R2} = ?$$

- 0.75 A
- (●) 1.45 mA ✓
- 0.25 A

✓ R1 = ? * 5/5

$$Step6.\ \mathrm{R_1} = \frac{V_{CC} - V_B}{\mathrm{I_{R1}}} - R_7 = ?$$

- 300 Ω
- (●) 1600 Ω ✓
- 5000 Ω