

Câu 1 (1.5đ):

Áp dụng Kirchhoff

$$\begin{cases} I_1 = I_2 + I_3 \\ 2I_1 + 6I_2 - 24 = 0 \\ 2I_1 + 6I_3 - 12 = 0 \end{cases}$$

0.75đ

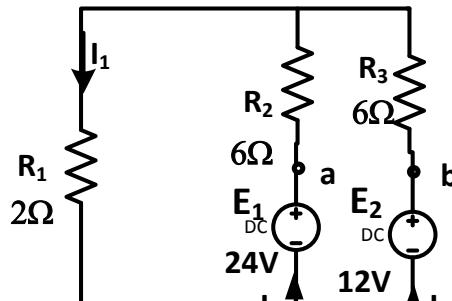
Giải được:

$$\begin{cases} I_1 = 3.6A \\ I_2 = 2.8A \\ I_3 = 0.8A \end{cases}$$

0.5đ

$$V_{ab} = E_1 - E_2 = 12V$$

0.25đ



Hình 1

Câu 2 (3đ)

a.

$$I_B = \frac{V_{CC} - V_{BE}}{R_B + (\beta + 1)R_E} = 0.025mA$$

0.5đ

$$I_C = \beta I_B = 5mA$$

0.25đ

$$V_{CE} = V_{CC} - I_C(R_C + R_E) = 12.35V$$

0.25đ

b.

$$V_E \approx I_C \times R_E = 1.65V$$

0.25đ

$$V_B = V_E + V_{BE} = 2.35V$$

0.25đ

$$V_C = V_{CE} + V_E = 14V$$

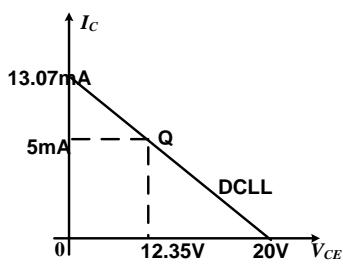
0.25đ

$$P_C = I_C \times V_{CE} = 61.75mW$$

0.25đ

$$\text{b. DCLL: } I_C = \frac{V_{CC}}{R_C + R_E} - \frac{V_{CE}}{R_C + R_E} = 13.07 - 0.65V_{CE} \quad (mA)$$

0.25đ



0.25đ

c. $Q = \frac{1}{2} \text{DCLL}$ thì $V_{CE} = 10V$, $I_C = 5mA$ không đổi

0.25đ

$$R_C = \frac{V_{CC} - V_{CE}}{I_C} - R_E = 1.67K\Omega$$

0.25đ

Câu 3 (2đ)

a. $V_{o1} = \left(1 + \frac{R_{F1}}{R_{I1}}\right) V_{i1} = 4V_{i1}$

0.5đ

$$V_o = \left(1 + \frac{R_{F2}}{R_{I2}}\right) V_{o1} - \frac{R_{F2}}{R_{I2}} V_{i2} = 44V_{i1} - 10V_{i2}$$

0.5đ

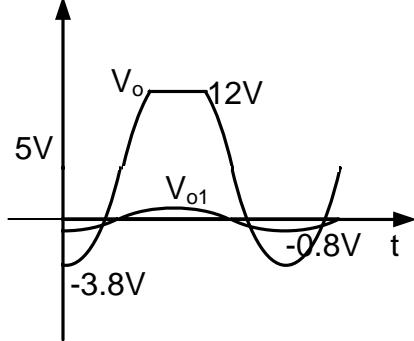
b. $V_{o1} = -0.8 \cos \omega t$ (V)

0.25đ

$V_o = -8.8 \cos \omega t + 5$ (V)

0.75đ

c.



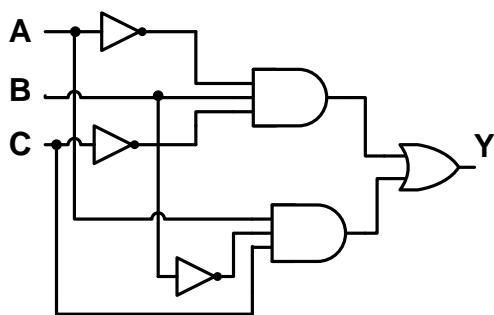
Câu 4 (2đ)

Biểu thức hàm logic: $Y = \overline{A}\overline{B}\overline{C} + A\overline{B}C$

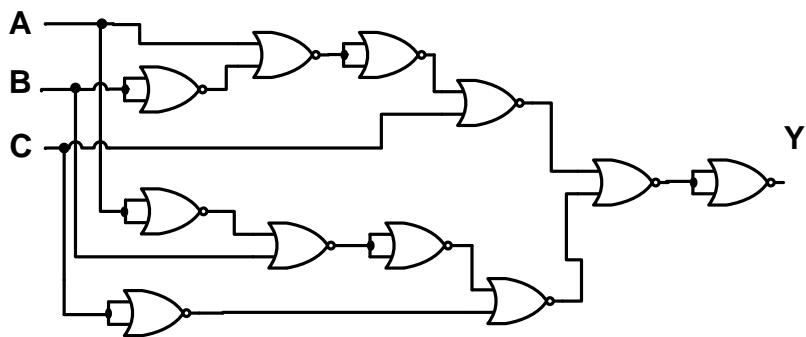
a. 0.75đ

A	B	C	$\overline{A}\overline{B}\overline{C}$	$A\overline{B}C$	Y
0	0	0	0	0	0
0	0	1	0	0	0
0	1	0	1	0	1
0	1	1	0	0	0
1	0	0	0	0	0
1	0	1	0	1	1
1	1	0	0	0	0
1	1	1	0	0	0

b. 0.75đ



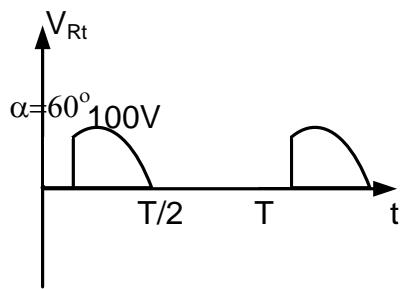
c. $Y = \overline{\overline{ABC}} + \overline{\overline{ABC}} = \overline{\left[\overline{(A+B)} + C \right]} + \overline{\left[\overline{(A+B)} + \overline{C} \right]}$



0.5đ

Câu 5 (1.5d):

a.



0.5đ

b.

$$V_{Rt(TB)} = \frac{V_{Rtm}}{2\pi} (1 + \cos \alpha) = 23.87V \quad 0.25đ$$

$$I_{Rt(TB)} = \frac{V_{Rt(TB)}}{R_t} = 0.095A \quad 0.25đ$$

$$c. V_{Rt(TB)}(\min) = \frac{V_{Rtm}}{2\pi} (1 + \cos 90^\circ) = 15.9V \quad 0.25đ$$

$$V_{Rt(TB)}(\max) = \frac{V_{Rtm}}{2\pi} (1 + \cos 0^\circ) = 31.83V \quad 0.25đ$$

Ghi chú: Cán bộ coi thi không giải thích đề thi.
Bỏ một đề thi vào túi đựng bài thi

Ngày tháng năm 2014
Thông qua Bộ môn