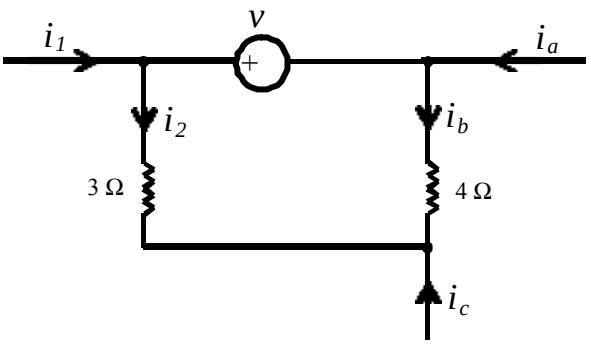
FINAL EXAM
Fall 05-06
Duration 105 minutes

Name : _____

ID: _____

Section:_____

I. **(10pts)**
In the adjacent figure, given:
i_a = 3A, i_b = 2A and i_c = - 8 A, determine
i_1, i_2 and v.



II. **(14pts).**

Design a regulated power supply using 24 V (rms), center-tapped transformer to supply 10 V at 500 mA, -10 V at 100 mA. What is the minimum current rating of the transformer? (Show your circuit as well as your calculations)

III. **(10pts)**.

a) By use of truth table show that:

$$\overline{\mathbf{A} \bullet \mathbf{B}} = \overline{\mathbf{A}} + \overline{\mathbf{B}}$$

$$\overline{\mathbf{A} + \mathbf{B}} = \overline{\mathbf{A}} \bullet \overline{\mathbf{B}}$$

b) Draw the circuit for the Boolean expression: $\mathbf{A.B.}\overline{\mathbf{C}} = \mathbf{OUT}$ using only NOR gates.

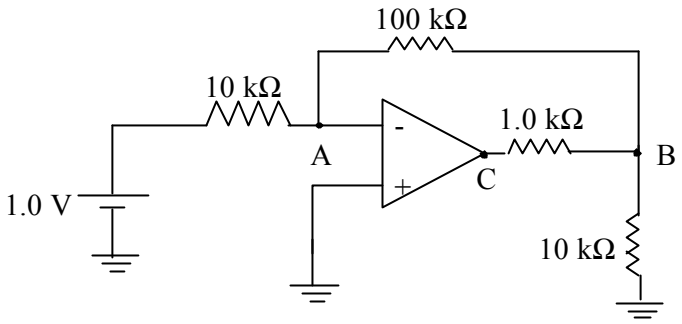
IV. **(8pts)**

Calculate V_o for:

a) V_i = 1.0 V

b) V_i = 10 V

V. **(12 pts)**
For the circuit shown, calculate the Voltages at points A, B, and C.



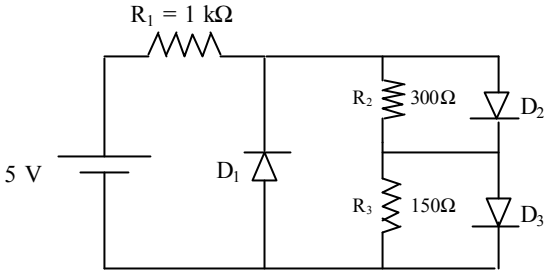
VI. **(10pts)**

In the adjacent circuit $V_i = V_p\cos(\omega t)$,
At what frequency is the
attenuation 10 db.

VII. **(10 pts)**
Write the Logic relations necessary for comparing two 2-bit binary numbers and indicating with OUT = 1 if A < B. The case A ≥ B should give OUT = 0). Design the logic circuit.

VIII. **(14pts)**

In the adjacent circuit check which of the diodes will be open and determine the current in each branch.
N. B. The diodes are made of Silicon.



IX. **(12 pts)**

a) In the adjacent circuit find the current flowing through the capacitor 0.3 s after the closure of the switch.

b) what is the voltage across the capacitor long after the switch is closed?