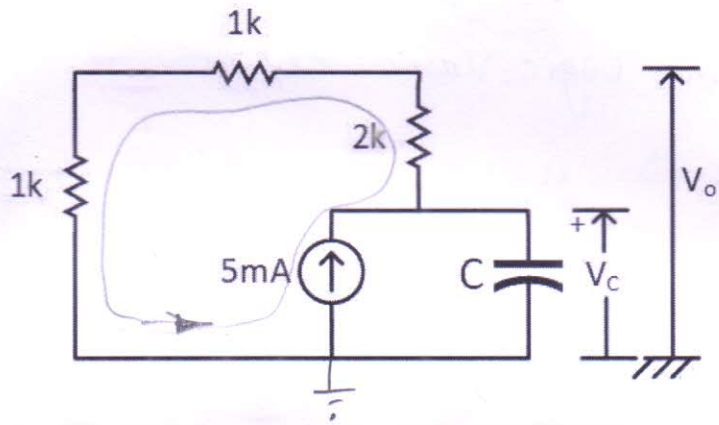
Q.7 For the circuit shown in fig below, determine the steady state voltage across C and V_o.

In steady-state, Capacitor C is fully charged and current of 5mA flows through resistors



$V_c = (4k \times 5mA) = 20V.$

$V_o = V_c - 2\times10^3 \times 5\times10^{-3}$.

$= 20 - 10$

$= 10V$

Q.8 A logic design is required for automatic switching ON & OFF of a motor used for pumping water to a water tank. Two micro-switches are fitted on the water tank to indicate water levels. The first one will close when the water level crosses 50% and the second one when it crosses 80%. It is desired to have water level always between these limits. Write a truth table for the above problem and design a simple logic circuit by which the motor can be switched ON/OFF automatically.

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Q8. Let S_A & S_B are the microswitches corresponding to the 80% and 50% Levels respectively.

Let us assume that these switches will be closed only when the respective Levels are exceeded.

Let switch closing corresponds to Logic '1'.

A & B are corresponding Logic Variables.

Truth Table

A	B	MOTOR
0	0	1
0	1	1
1	0	X
1	1	0

In 3rd Case, (A=1, B=0), output is don't care, because this condition can never happen

	$\bar{A}$	A
$\bar{B}$	1	X
B	1	0

Considering X → 1

Motor = $\bar{A} + \bar{B}$

Considering X → 0

Motor = $\bar{A}$.

manual grading. Rubrics. Added in runtime.