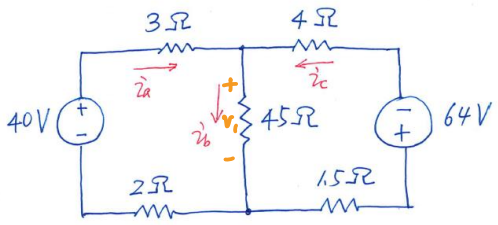
ECEN3714 **Homework #01**

Section # 20696 Name (PRINT): Bennett (LAST NAME), Roger (First Name)

1. Find the branch-currents i_a, i_b, and i_c in the circuit shown below (note: do NOT use the mesh-current method. Use the branch-current method. Using mesh-current method will receive 0 points on this problem). (**5 points**).

$$i_a + i_c - i_b = 0$$

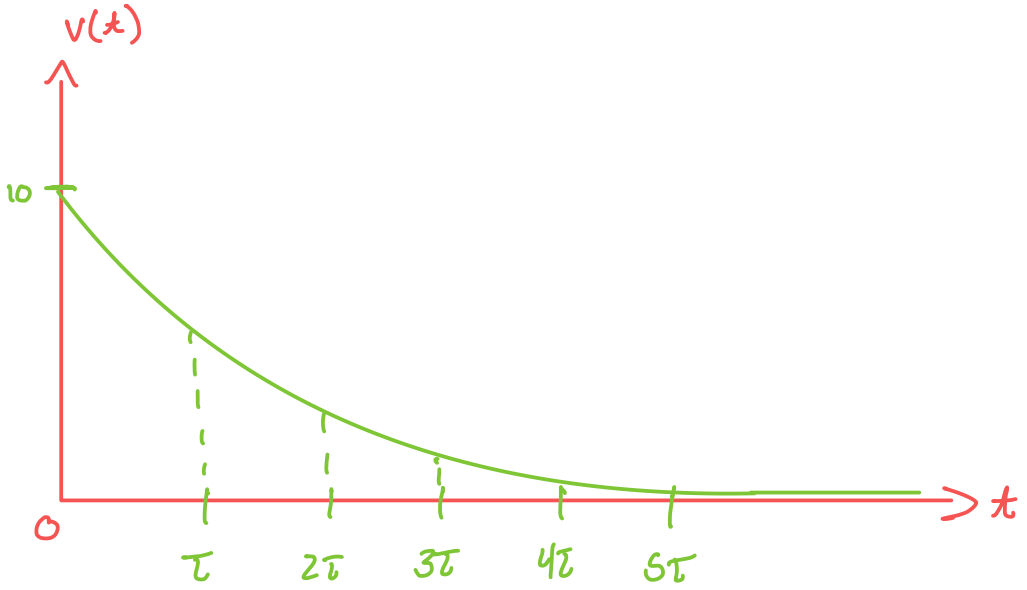


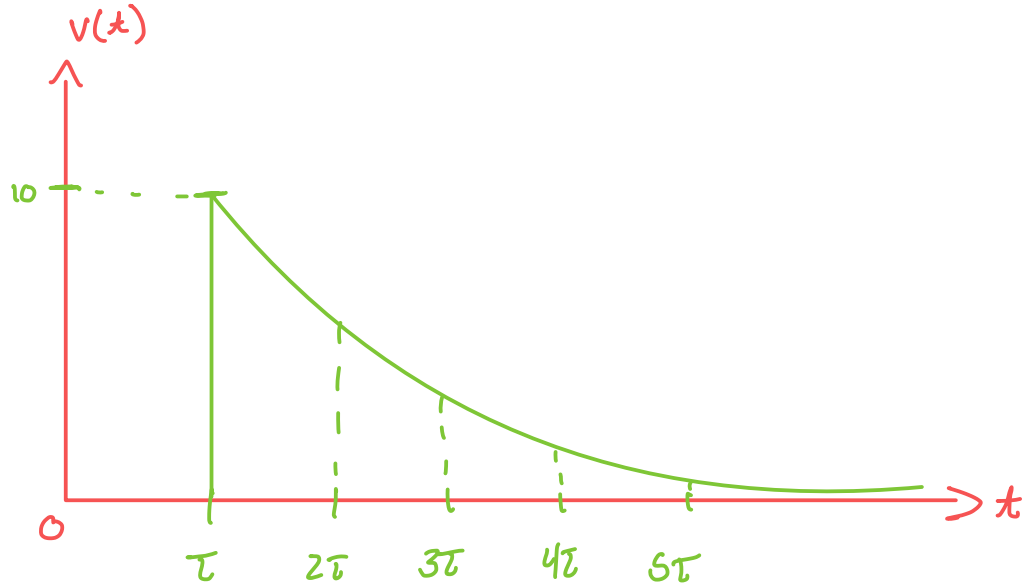
$$-\frac{V_1 - 40}{3} + \frac{V_1}{45} - \frac{V_1 - 64}{4} = 0$$

$$V_1 = 52.28\ V$$

$$i_b = \frac{v}{R} = \frac{52.28}{45} = 1.162A$$

2. (a) Sketch $v(t) = 10exp(-t/\tau)$ over $t \in [0,\ 5\tau]$ at an interval of τ. Pay attention to the labels/scales.
(b) Sketch $v(t) = 10exp(-t/\tau) + 1$ over $t \in [0,\ 5\tau]$ at an interval of τ. Pay attention to the labels/scales.
The scales of the (b) shall be the same as those of (a). Ideally you could plot two curves in one figure. (**4 points**)





3. Sketch $f(t) = 10 \cdot u(t) - 5 \cdot u(t-7)$, where $u(t)$ is a unit step function **(1 point, All or None)**