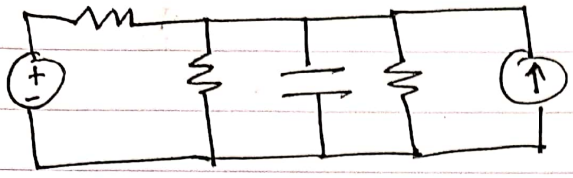
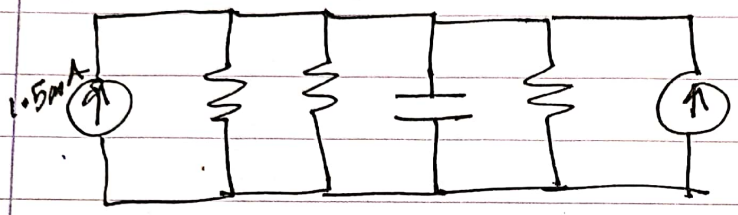
Date:

a) Analyze circuit at $t=0^-$ — 0·5 Mark (circuit is considered with switch closed)

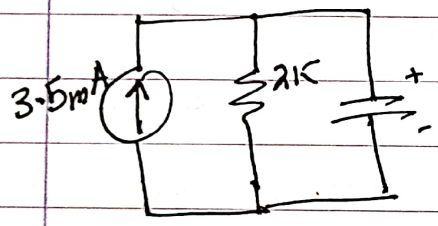


2marks on method used.

S.T



Simplify parallel Resistors & C, source



$V = IR$

$= 3.5mA \times 2K$

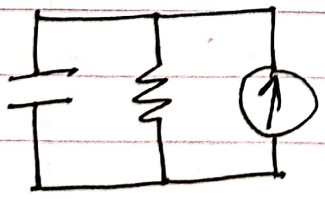
$= 7V$

0·5 Mark (Ohms law & final Answer)

b) $V_o(0^+) = V(0^-)$ Cap does not allow inst-change in voltage.

1 MARK CECF if part A is incorrect.

c) circuit at $t=0^+$ 0·5 Mark (circuit considered with switch open).



Nodal Analysis.

$$\frac{V(t)}{6K} + 2.5u\frac{dV(t)}{dt} = 2m$$

1 Mark (Correct Eq)

$$\frac{dV(t)}{dt} + 300V(t) = 800$$

0·5 Mark (Eq in standard form)

EASE

d)

Equivalent Model of energized capacitor used 0-5 Mark

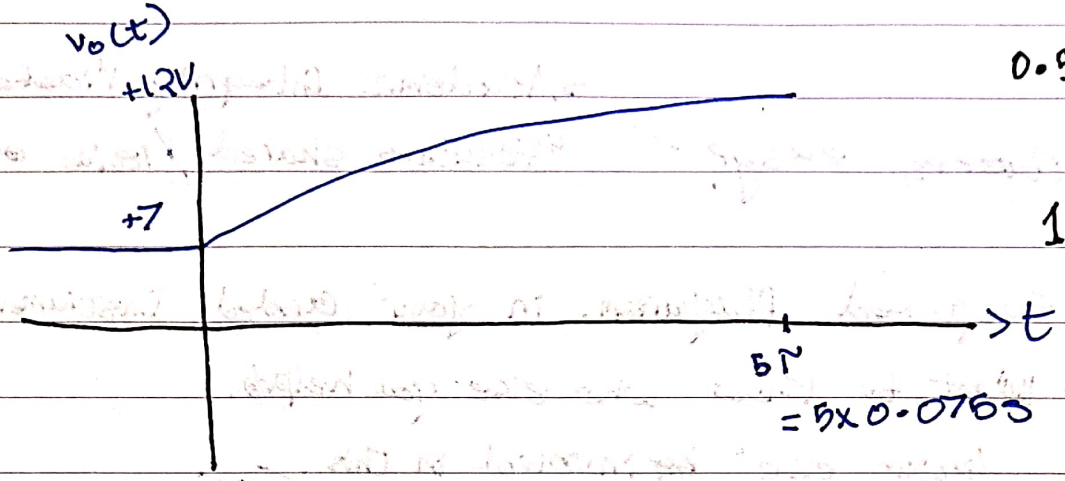
$V = IR$

$= 6000 \times 2 \times 10^{-3}$

$= 12V$

0.5 Mark for Ohms law. & Ans.

e)



0.5 Mark for Imp Points Marked.

1 Mark for Correct Shape.

$K_1 = v(\infty) = 12V$

$K_2 = v(0+) - K_1$

$= -5V$

$\tau = RC$ 0.5 Mark.

$= 6000 \times 2.5 \times 10^{-6}$

$= 0.015$

$$v_o(t) = \begin{cases} 7V & t < 0 \\ 12 - 5e^{-\frac{200}{3}t} & t \geq 0 \end{cases}$$

1 Mark for overall correct Expression