

JK Lakshmipat University Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination, December 2023

B. Tech. (CSE), Semester III

Roll No.....

E1407: Transient Analysis and Network Synthesis

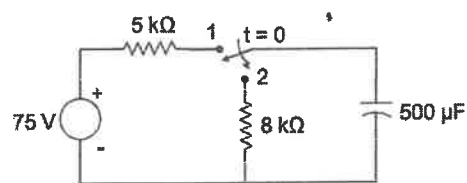
Time: 2 hours

Max. Marks: 30

Instructions to students:

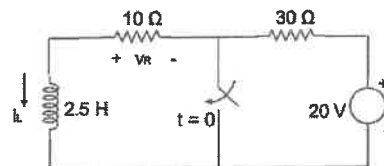
1. Do not write anything other than your roll number on the question paper.
2. Mention all the assumptions for your answers clearly.

- Q. 1 The switch in the circuit shown in Figure 1 is moved from position 1 to position 2 at time $t = 0$. Sketch the waveform of $V_C(0^-)$, $i_C(t)$ and $v_C(t)$.



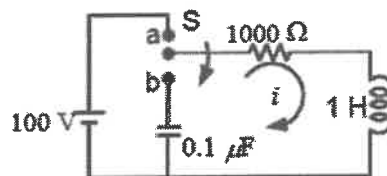
4.0
(LO1)

- Q. 2 In the circuit shown in figure 2, the switch is closed at $t = 0$. Determine the $i_L(0^-)$, $i_L(t)$ and $v_R(t)$.



5.0
(LO1)

- Q. 3 In the circuit shown below, switch S is changed from position a to b at $t = 0$. Steady-state conditions have been reached at $t = 0^-$. Find the values of $i_L(0^-)$, $i_L(t)$ and $v_L(t)$. Assume the capacitor is initially uncharged.



5.0
(LO1)

- Q. 4 Check the stability of the following function using Hurwitz criteria and calculate the number of roots that lie in the right half of the s-plane.

6.0
(LO3)

(a) $f(s) = s^7 + 2s^6 + 2s^5 + s^4 + 4s^3 + 8s^2 + 8s + 4$

(b) $f(s) = s^5 + 3s^3 + s$

(c) $f(s) = s^4 + 7s^3 + 4s^2 + 18s + 6$

- Q. 5 Synthesize the below function in foster-I and Cauer-II form.

5.0
(LO2)

$$Z(s) = \frac{2(s+1)(s+3)}{(s+2)(s+6)}$$

- Q. 6 Synthesize the below function in foster-II and Cauer-I form.

5.0
(LO2)

$$Y(s) = \frac{2(s^2+4)(s^2+6)}{(s^2+3)(s^2+5)}$$

all the best!