

JK Lakshmipat University Jaipur
INSTITUTE OF ENGINEERING AND TECHNOLOGY

End Term Examination, May 2025
 B. Tech. (Backlog)

Roll No.....

EE1407: Transient Analysis and Network Synthesis

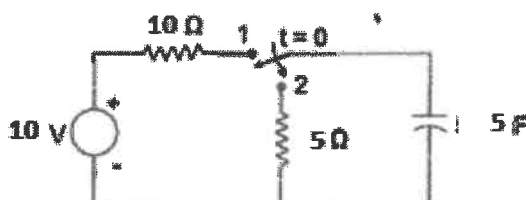
Time: 2 hours

Max. Marks: 30

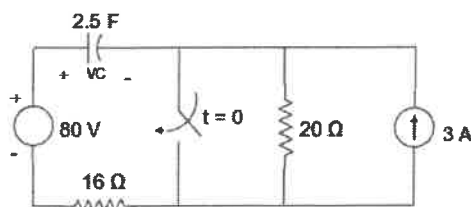
Instructions to students:

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 In an RC circuit, having a time constant of 2.5 ms, the capacitor discharges with an initial voltage of 80 V. (a) Find the time at which the capacitor voltage reaches 30 V and 10 V (b) Calculate the capacitor voltage at 2 ms. 4.0 (LO1)
- Q. 2 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 $v_C(t)$. 5.0 (LO1)



- Q. 3 Consider the circuit shown. The switch was in an open position for a long time. It is operated as shown. Compute and plot the capacitor voltage for $t > 0$. Also find the time at which the capacitor voltage is 50 V. 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) $f(s) = s^5 + s^4 + 6s^3 + 4s^2 + 8s + 3$
- (b) $f(s) = s^4 + 3s^2 + 5$
- (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)

$$Z(s) = \frac{5(s+2)(s+4)}{(s+1)(s+3)}$$

- Q. 6 Synthesize the below function in foster-II and Cauer-I form. 5.0 (LO2)

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

all the best!