DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE – RAIGAD -402 103

Winter Semester Examination – Dec. - 2019

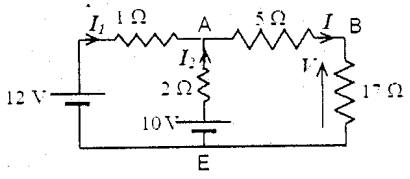
Branch: S. Y. B. Tech (Electrical Engineering) **Sem.:-** III
Subject:- Network Analysis & Synthesis- BTEEC302 **Marks:** 60
Date:- 12/12/2019 **Time:-** 3 Hr.

Instructions to the Students

1. Each question carries 12 marks.
2. Attempt **any five** questions of the following.
3. Illustrate your answers with neat sketches, diagram etc. wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and should mention it clearly

(Marks)

Q.1. a) Find I in the circuit shown in below Fig. by using superposition theorem (6)



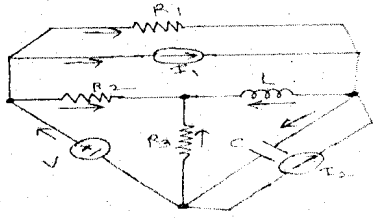
b) Define the following terms :- (6)

(i) Unilateral element (ii) Bilateral element (iii) Linear element

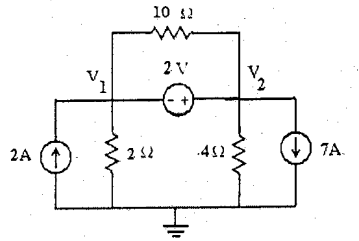
(iv) non-linear element.

Q.2. a) Draw oriented GRAPH for given electrical network. (6)

Find 1) Rank of graph 2) Number of Branches 3) Number of Trees 4) Number of Twigs 5) Number of Links/ Chords

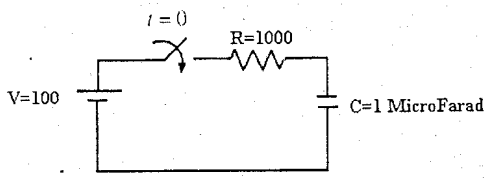


b) By using the supernode concept find out the node voltages V_1 & V_2 (6)

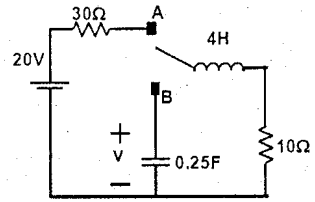


Q.3. a) In the circuit shown in Fig. the switch is closed at t=0 Find the values of i , $\frac{di}{dt}$ and $\frac{d^2i}{dt^2}$ (6)

at $t=0^+$ if R=1000Ω, C=1μF and V=100V. Capacitor is initially uncharged.



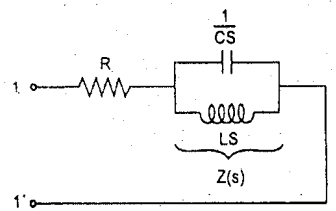
b) In the circuit shown in Fig., the switch is moved from A to B at t=0. Find v(t) for t>0. (6)



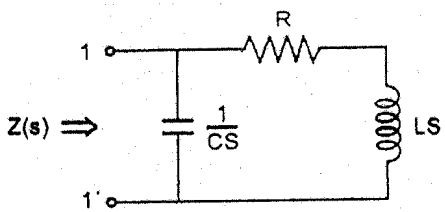
Q.4. a) State and Prove Convolution integral theorem for Laplace transform. (6)

b) Find out $Z_{11}(S)$ and $Y_{11}(S)$ of networks shown below.

(i) (3)

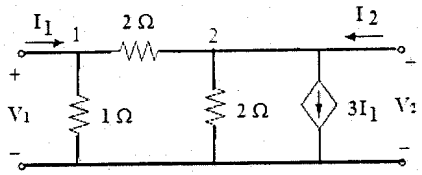


ii) (3)



Q.5. **Solve Any TWO**

a) Find Y and Z parameters for the network shown in Fig. which contains a current controlled source. (6)



b) State and prove the symmetry & reciprocity conditions for transmission line parameters. (6)

c) The Z Parameter of A Two Port Network Are Z11 = 20 Ω, Z22= 30 Ω, Z12=Z21=10 Ω. (6)

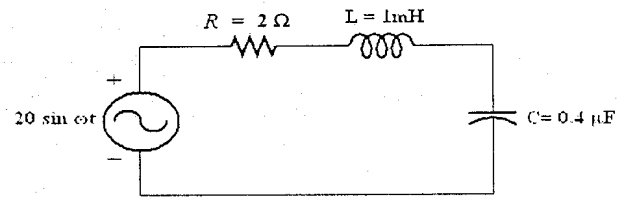
Find Y And ABCD parameters.

Q.6. a) In the circuit in Fig., R = 2 &, L = 1 mH, and C = 0.4 μF. (6)

(i) Find the resonant frequency and the half-power frequencies.

(ii) Calculate the quality factor and bandwidth.

(iii) Determine the amplitude of the current at ω_0, ω_1, and ω_2.



b) Write a note on Low pass & High pass, Band pass & band reject filter. (6)

Paper End