B **B3B007** **Total Pages:4**

Reg. No:_____ Name:_____

APJ ABDUL KALAM TECHNOLOGICAL UNIVERSITY

THIRD SEMESTER B.TECH DEGREE EXAMINATION, JANUARY 2017

Course Code: **EC201**

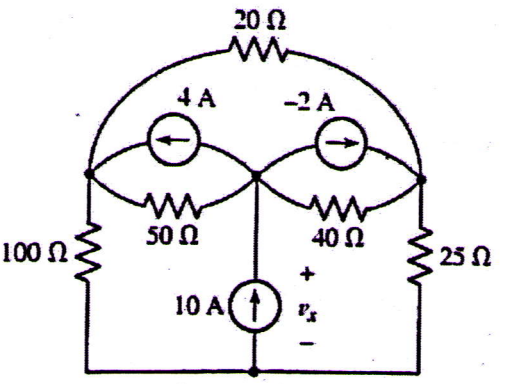
Course Name:**NETWORK THEORY (AE, EC)**

Max. Marks: 100 Duration: 3 Hours

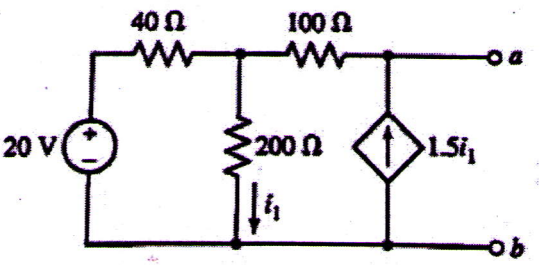
PART A

Question No. 1 is compulsory. Answer Question 2 or 3

1. a. Use nodal analysis to find v_x in the circuit. (6)

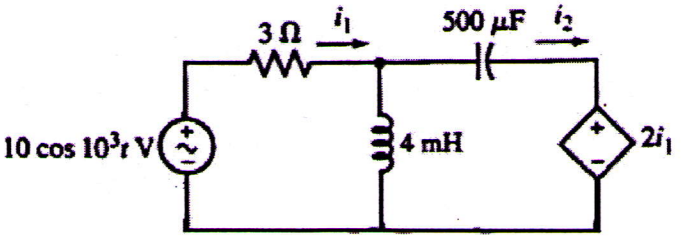


b. Find the Thevenin equivalent of the network shown in figure. What power would be delivered to a load of 100 ohms at *a* and *b*? (6)

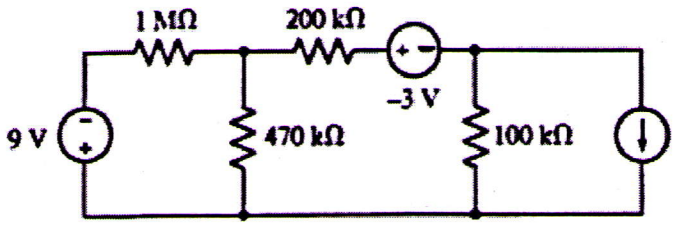


c. State and prove maximum power transfer theorem. (3)

2. a. Obtain the expressions for the time-domain currents i_1 and i_2 in the circuit (8)

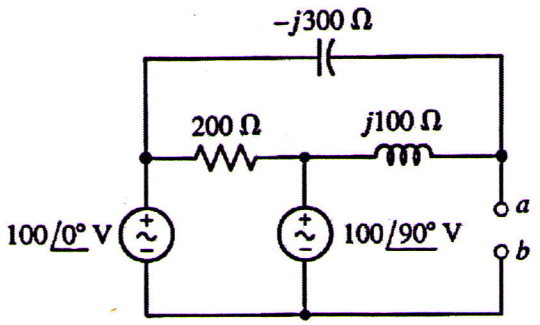


b. Explain source transformations and use it to determine the power dissipated by 1MΩ resistance. (7)



1. OR

3. a. Find the Thevenin equivalent circuit with respect to terminals *a* and *b* (9)

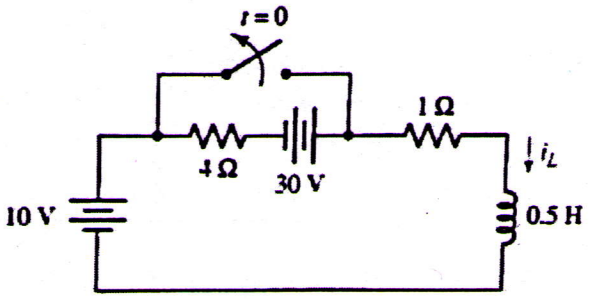


b. State and prove time differentiation and time integration theorems in Laplace Transform (6)

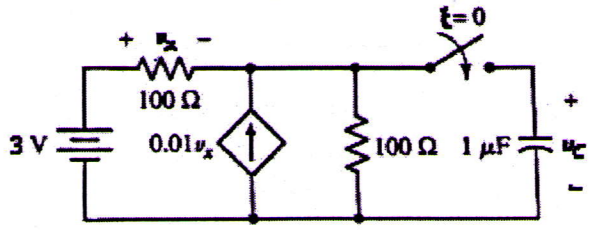
PART B

Question No. 4 is compulsory. Answer Question 5 or 6

4. a. Derive transient current and voltage responses of sinusoidal driven RL and RC circuits. (10)
   b. Explain how to determine the time domain behaviour from the pole - zero plot. (5)
5. a. Find the current $i_L(t)$ for all t after the switch opens. (8)



b. Find $v_C(t)$ for $t>0$ in the circuit. (7)



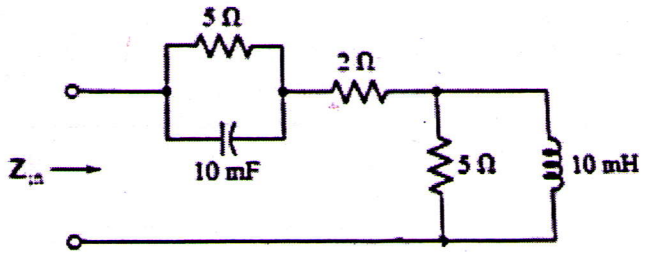
OR

6. What are the restrictions on pole and zero locations for transfer functions and driving-point functions. (15)

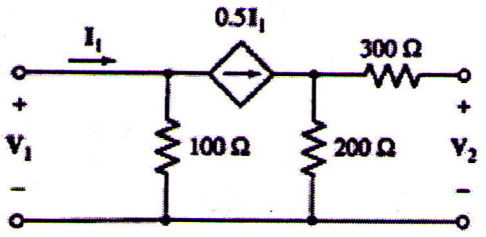
PART C

Question No. 7 is compulsory. Answer Question 8 or 9

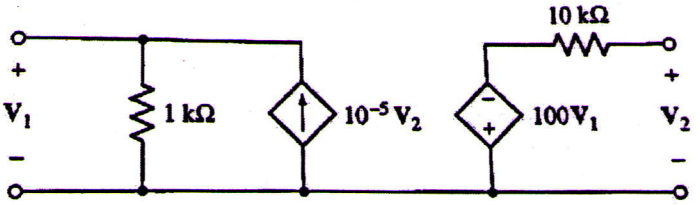
7. a. Explain the series and parallel connection of two port networks. (8)
   b. Derive the interrelationship between transmission and hybrid two port network parameters. (6)
   c. For the network shown in figure find the resonant frequency. (6)



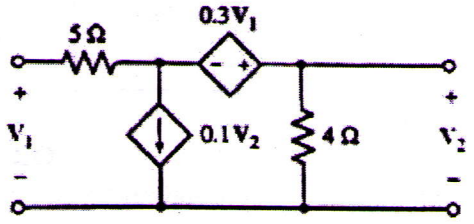
8. a. Find yparameters for the two-port network shown in figure. (6)



b. Calculate h parameters for the two-port network shown in figure. (7)

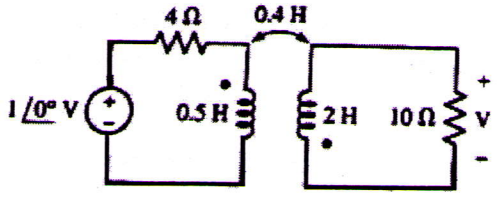


c. Calculate transmission parameters for the two-port network shown in figure. (7)

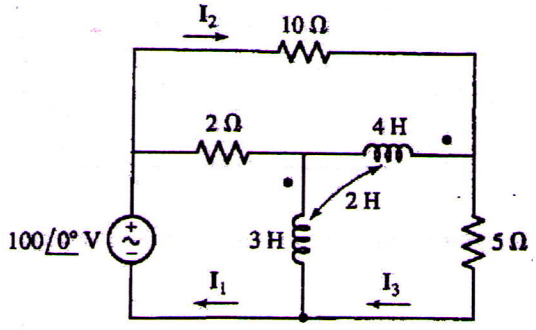


OR

9. a. Find V in the circuit. (4)



b. Find the time domain values of currents marked in the circuit. (10)



c. Explain the following terms (6)

(i) Bandwidth (ii) Q-factor (iii) Selectivity