

Reg. No: 

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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)

**B.Tech I Year II Semester Supplementary Examinations February-2022**

**NETWORK ANALYSIS**

(Electronics and Communication Engineering)

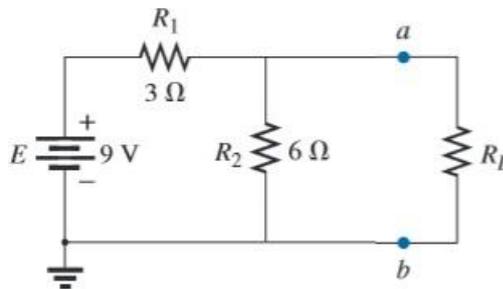
Time: 3 hours

Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

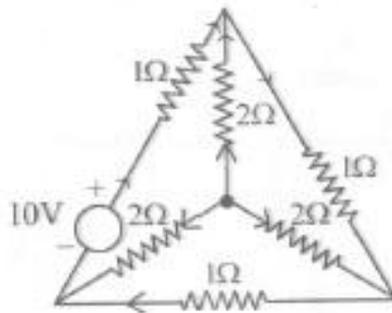
**UNIT-I**

- 1 a State and explain Superposition theorem? 6M  
b Find Norton's equivalent for the following circuit. 6M



**OR**

- 2 a Define and state the properties of incidence matrix. 6M  
b For the network shown below draw the graph and find incidence and tie – set matrices. 6M



**UNIT-II**

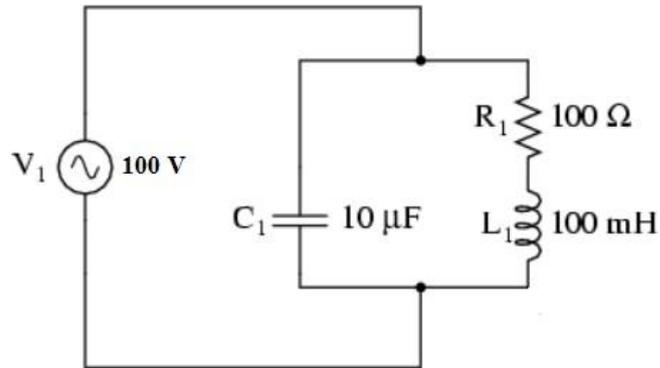
- 3 a Explain about Natural & Forced Response of RLC Circuits. 6M  
b A resistor of  $50\Omega$ , inductance of  $100\text{mH}$  and a capacitance of  $100\mu\text{F}$  are connected in series across  $200\text{V}$ ,  $50\text{Hz}$  supply. Determine the following 6M  
(i) Impedance (ii) current flowing through the circuit (iii) power factor  
(iv) voltage across R,L & C (v) power in watts

**OR**

- 4 a Explain the characteristics of sinusoids. 6M  
b The impedances of parallel circuit are  $Z_1 = (6+j8)$  ohms and  $Z_2 = (8-j6)$  ohms. If the applied voltage is  $120\text{V}$ , find (i) current and power factor of each branch (ii) overall current (iii) power consumed by each impedance. Draw the phasor diagram. 6M

## UNIT-III

- 5 a Obtain the expression for resonant frequency, bandwidth and Q-factor for parallel R-L-C circuit. 6M  
 b In a parallel Resonant circuit shown in figure. (1), find the Resonant frequency, Dynamic Impedance, Bandwidth, Q-factor and Current at resonance? 6M

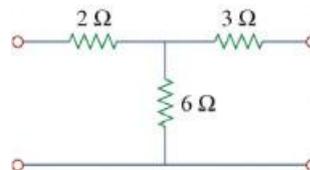


OR

- 6 a Discuss briefly about energy considerations in mutually coupled circuits. 6M  
 b Obtain the expression for resonant frequency, bandwidth and Q-factor for Series R-L-C circuit. 6M

## UNIT-IV

- 7 a Find the Y- parameters for the following circuit: 6M



- b Express h parameters in terms of ABCD parameters. 6M

OR

- 8 a What are the advantages of state variable analysis. 6M  
 b The transfer function of a system is  $G(s) = 2/(s+1)(s+2)$ . Obtain a state variable representation for the system. 6M

## UNIT-V

- 9 a Design a constant K high pass filter and explain its design procedure in detail. 6M  
 b Derive the expression for characteristic impedance in a pass band filter. 6M

OR

- 10 a What is an m-derived filter? Explain the general configuration and parameters of m-derived low pass filter. 6M  
 b What is high pass filter. Explain the general configuration and parameters of a constant-K band pass filter: 6M

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