

**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)

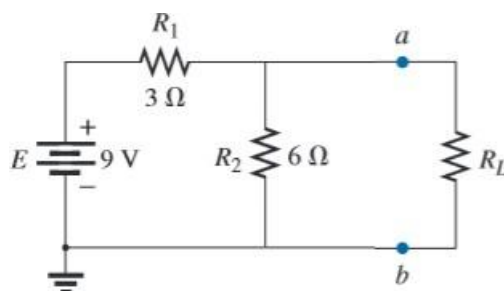
Time: 3 hours

Max. Marks: 60

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

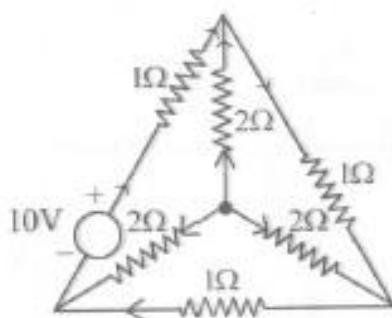
**UNIT-I**

- 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**

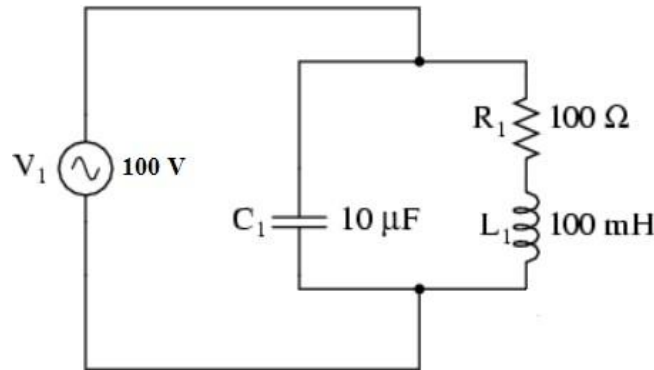
- 3 a** Explain about Natural & Forced Response of RLC Circuits. **6M**  
**b** A resistor of  $50\Omega$ , inductance of  $100\text{mH}$  and a capacitance of  $100\mu\text{F}$  are connected in series across  $200\text{V}$ ,  $50\text{Hz}$  supply. Determine the following **6M**  
 (i) Impedance (ii) 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  $Z_1 = (6+j8)\text{ ohms}$  and  $Z_2 = (8-j6)\text{ ohms}$ . 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**

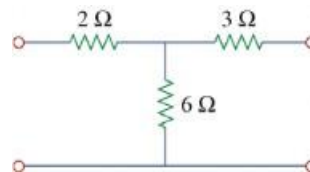
- 5 a Obtain the expression for resonant frequency, bandwidth and Q-factor for parallel R-L-C circuit. **6M**  
 b In a parallel Resonant circuit shown in figure. (1), find the Resonant frequency, Dynamic Impedance, Bandwidth, Q-factor and Current at resonance? **6M**

**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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