

CEE-101 NETWORK ANALYSIS AND SYNTHESIS

Time: 3 Hours

Max. Marks: 50

Answer any FIVE questions. All questions carry equal marks. Assume suitable missing data if any.

- 1. (a) Explain Superposition theorem with suitable diagrams. (3)
- (b) Determine the current I_1 in the circuit of Fig.1 by Superposition theorem.(7)

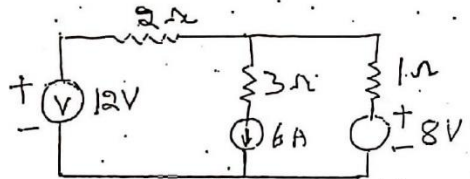


Fig.1

- 2. (a) Explain the following theorems with the suitable diagrams: (5)
 - (i) Norton's theorem
 - (ii) Millman's theorem
- (b) Using Millman's theorem, find the current through 10Ω resistance in the circuit of Fig. 2. (5)

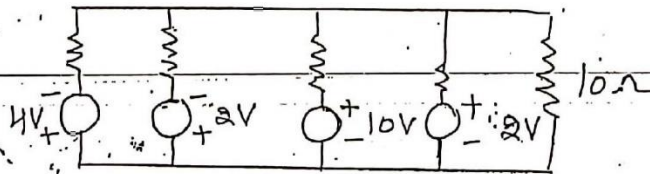


Fig.2

- 3. (a) Derive relationship between delta and star. (5)
- (b) Calculate the value of resistance which will absorb maximum power in the circuit of Fig. 3. Also compute the maximum power.

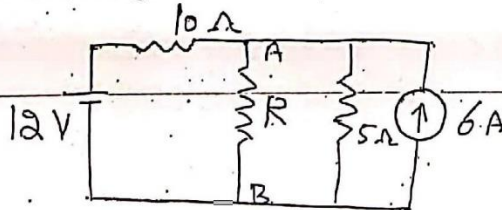


Fig.3

4. Find the Y-parameters & ABCD parameters for the circuit shown in Fig. 4. (10)

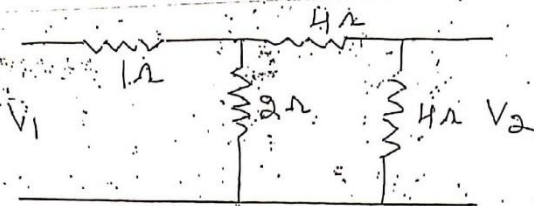


Fig. 4

5. (a) Explain the Fourier series. (3)
 (b) Find the Fourier series for the square wave shown in Fig. 5. (7)

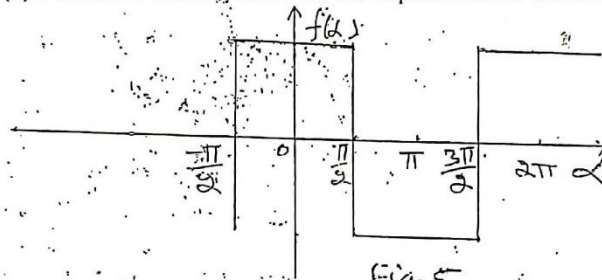


Fig. 5

6. (a) Derive the expression for the current in DC series RC-circuit assuming initial charge as $10 \mu\text{C}$. (5)
 (b) The battery voltage is applied for a steady state period. Obtain the complete expression for the current after closing the switch K in the Fig. 6. Assume $R_1=1 \Omega$, $R_2=2 \Omega$, $L_1=1 \text{ H}$ & $V=10\text{V}$. Calculate the value of current after one second of closing of switch.

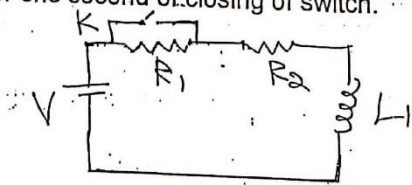


Fig-6

7. Explain the following terms with suitable diagrams:
 (a) Oriented graph (2)
 (b) Tree & twigs (2)
 (c) Cut-sets (3)
 (d) Cut-set matrix. (3)