

Sem-3<sup>rd</sup>

# Assignment Question.

Branch - Electrical Chapter-1 Magnetic Circuits

- ① What is magnetising force & what is its unit? 2
- ② Write the relation between magnetic flux density, permeability & field strength? 2
- ③ Define (a) Reluctance 2  
(b) permeance
- ④ What do you mean by magnetic hysteresis? 2
- ⑤ What is coercivity property of a magnetic substance? 2

## Long Questions

1. Distinguish between an electrical & magnetic circuit. 5
2. What is hysteresis loop? Explain the features of the loop briefly? 5
3. Distinguish between series & parallel magnetic circuit? 5
4. A magnetic iron has mean circumference of 1.5 m & is of  $0.01 \text{ m}^2$  cross section. It is wound with 200 turns. A saw cut of 4mm wide is made in the ring. Calculate the magnetising current required to produce a flux of  $0.08 \text{ mwb}$  in the air gap. Assume relative permeability as 400 & leakage coefficient = 1.3 5

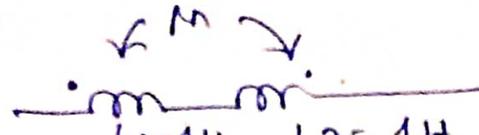
(5) Explain hysteresis loop with diagram. [10]

(6) Write the analogy between electric & magnetic circuit [5]

(7) Dis briefly the B-H curve of ferro-magnetic material [5]

Assignment Questions  
Chapter-2 Coupled circuits

Short Questions

- (1) State Lenz's Law 2
- (2) Define mutual inductance. 2
- (3) What do you mean by (a) Linkage flux 2  
(b) Leakage flux.
- (4) What is co-efficient of coupling? 2
- (5)   
find  $L_{eq}$  of the give fig. 2
- (6) The two coils have self inductances  $1H$  &  $4H$  with co-efficient of coupling  $0.5$ . find the mutual inductance  $M$ . ? 2
- (7) find the value of self inductance if the flux in the coil is  $0.1$  Wb & the current is  $1A$ . The no. of turns of the coil is  $1000$ . 2

## Long Questions

- ① What is the difference between self inductance & mutual inductance.  $\lfloor 5$
- ② What is co-efficient of coupling? What is its range? & for an ideal transformer what will be its value.  $\lfloor 5$
- ③ What is DOT convention? Explain the DOT convention for coupled circuits.  $\lfloor 5$ .

# Assignment Questions

## Chapter-3 Circuit Element & Analysis

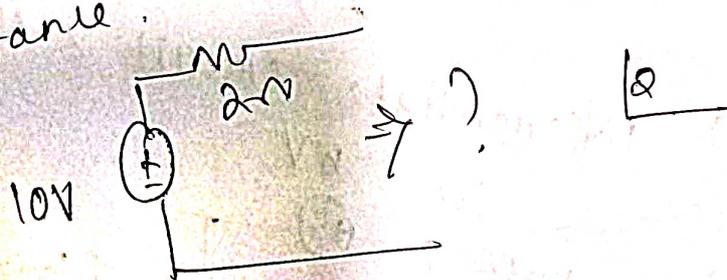
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① Define (a) Active Element (2)  
(b) passive Element

② Distinguish between Linear & Non-linear element? (2)

③ What do you mean by unilateral & bilateral element give one example of each. (2)

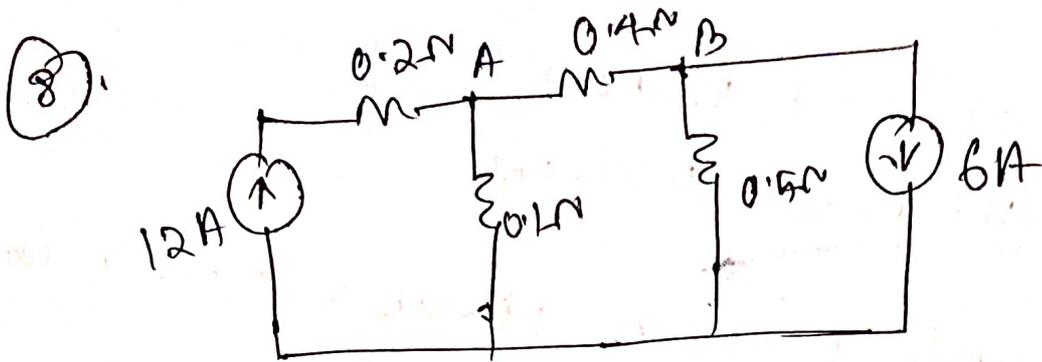
④ Convert this given circuit to equivalent circuit containing current source & resistance. (2)



⑤ State & Explain (a) KCL (5)  
(b) KVL

⑥ State ohm's law (2)

- 7) What is (a) super node 2  
 (b) super mesh 2

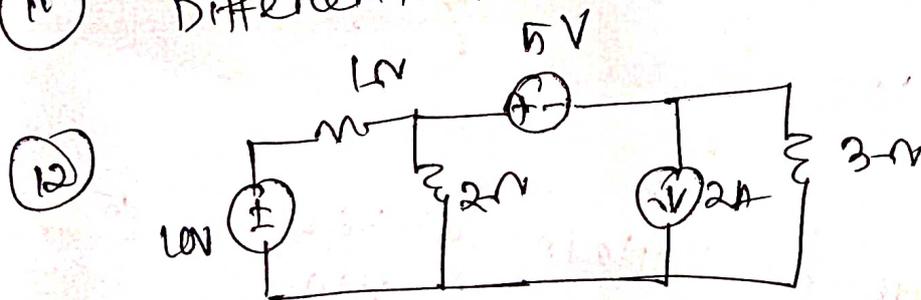


find the voltage across A & B by using nodal analysis. 5

- 9) What is Ideal & practical voltage source 2

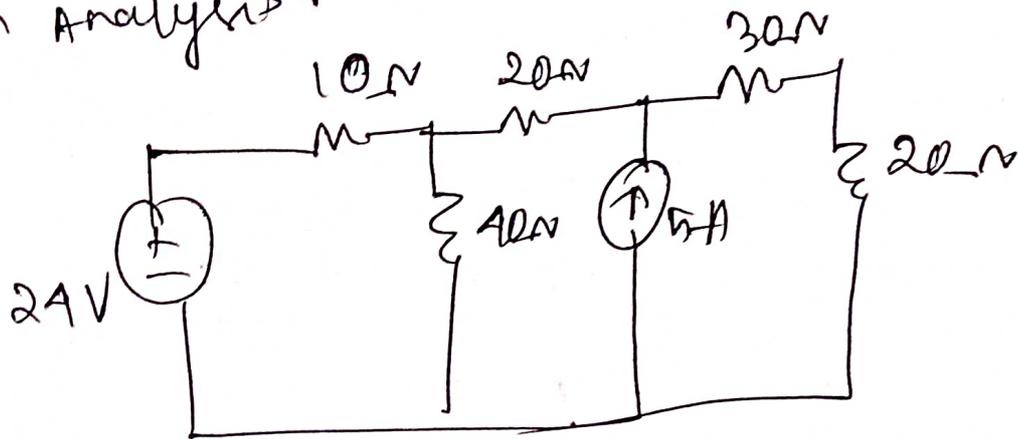
- 10) Define (a) node 1  
 (b) branch 1  
 (c) mesh 1  
 (d) loop 1

- 11) Differentiate circuit & Network 2



find current through 3Ω by using nodal analysis 5

find all the Loop current by using mesh analysis

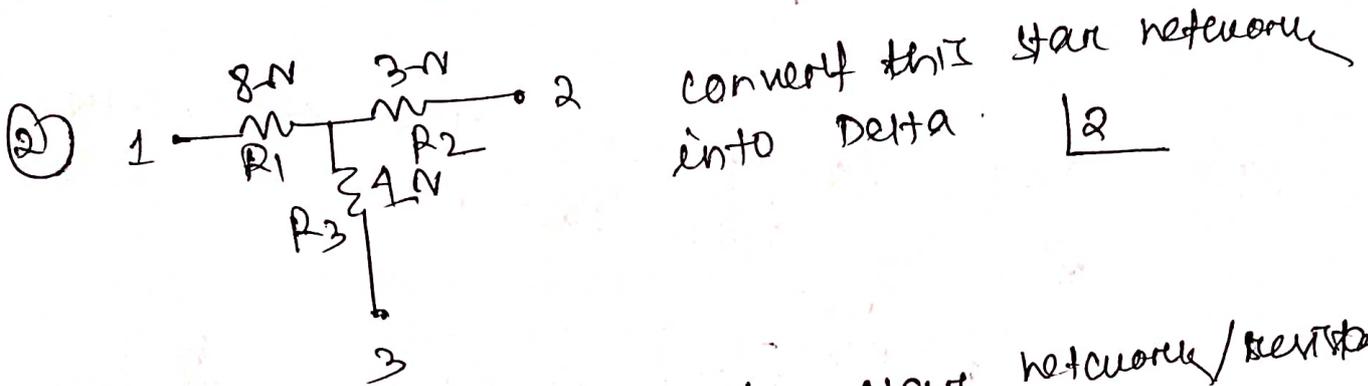


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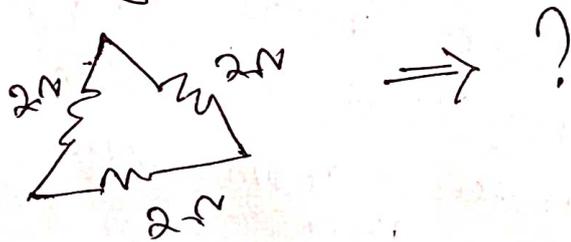
# Assignment Questions

## Chapter-4 Network Theorems

- ① What is (a) star connection |2  
 (b) delta connection

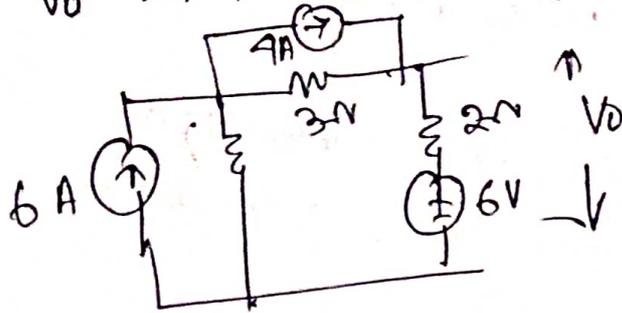


- ③ Find the equivalent star network / resistances of the given Delta network

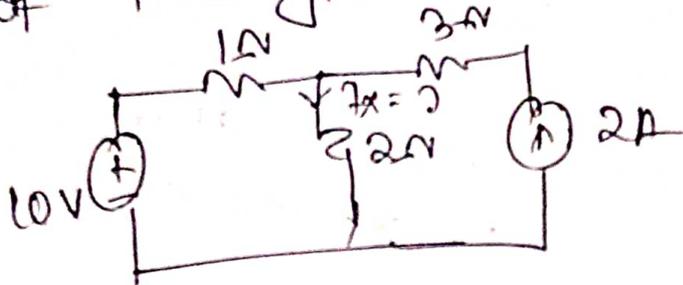


- ④ State & explain superposition theorem. |5
- ⑤ State & explain Thevenin's theorem. |5
- ⑥ State & explain Norton's theorem |5
- ⑦ State & explain maximum power transfer theorem. ~~the~~ & derive the condition at which maximum power to be transferred from source to load. |10

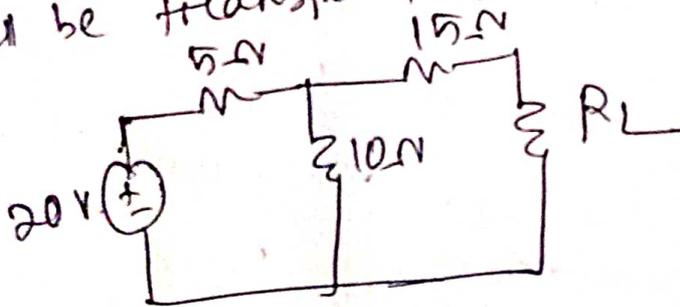
8) By using superposition theorem, find the  $V_o$  in the circuit given.



9) Find  $I_x$  by using Norton's theorem of the given circuit



10) In the <sup>below</sup> given circuit find the value of  $R_L$  such that maximum power can be transferred from source to load



# Assignment Questions

## Chapter-5 AC circuit & Resonance

- ① What is form factor? 2
- ② What is rms value? 2
- ③ What do you mean by (a) Bandwidth 2  
(b) selectivity 2
- ④ Draw the power triangle of series R-L circuit. 2
- ⑤ Express the given voltage  $(5 + j3) \text{ V}$  to polar form. 2
- ⑥ What is resonance? 2
- ⑦ What is power factor? 2
- ⑧ Define time constant in R-L circuit. 2
- ⑨ State (a) quality factor for series resonant circuit? 2
- ⑩ What is resonant frequency? 2
- ⑪ Draw the power triangle of series R-L circuit & state the expression for active, reactive & Apparent power. 5

(12) In a RLC series circuit  $R = 0.2 \Omega$ ,  $L = 100 \text{ mH}$ ,  $C = 50 \text{ nF}$ , determine the resonant frequency & corresponding input current when supply voltage is  $24 \text{ V}$ . 10

(13) In a series RLC resonance circuit the resistance ( $R$ ), inductive reactance ( $X_L$ ) are  $10 \Omega$ ,  $5 \Omega$  respectively. What will be the nature of  $X_C$  &  $Z$ ? 5

(14) Two impedances consisting of  $R, L$  &  $R, C$  series circuits are connected in parallel. The values of  $R_1 = 10 \Omega$ ,  $X_L = 5 \Omega$ ,  $R_2 = 8 \Omega$ ,  $X_C = 6 \Omega$ . If the combination is connected across an ac source of  $200 \angle 0^\circ$ . Find the resulting currents (7). ~~8~~ also draw 10

(15) Write the condition for  
(a) series resonance 2  
(b) parallel resonance

(16) What is (a) inductive reactance 18  
(b) capacitive reactance

(17) Derive the expression for lower & upper half power frequencies of a resonant series R-L-C circuit. 15

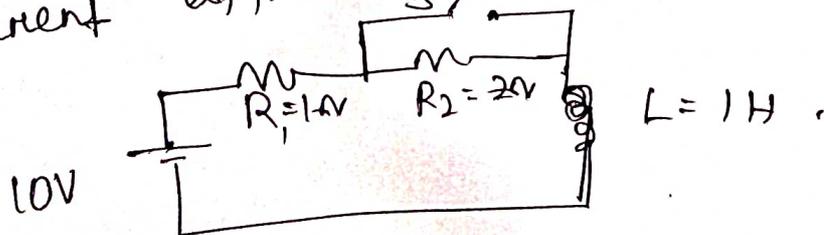
Chapter-6  
Assignment Questions  
Poly phase circuits

- Q. 1) Comparison between 1- $\phi$  & 3- $\phi$  system. [5]
- Q. 2) What is (1) Line quantities  
(2) phase quantities [2]
- Q. 3) What is (1) Star connection [2]  
(2) Delta connection.
- Q. 4) Derive the relationship between Line phase voltage in star connection [5]
- Q. 5) State the merits of polyphase system over single phase system. [5]
- Q. 6) Derive the relationship between line current & phase current in Delta connection. [5]
- Q. 7) Explain the 3- $\phi$  power measurement by using (1) one wattmeter method [2]  
~~(2) two watt~~
- Q. 8) Explain the measurement of 3- $\phi$  power using 2-watt meter method. [5]

# Assignment questions - Chapter - 7 Transients

- ① What is transient? 12
- ② Define time constant of R, L series circuit connected to a dc source? 12
- ③ Define time constant for a series R-L circuit connected to a dc source. 12
- ④ Define the steady state condition. 12
- ⑤ Write down the expression for the voltage across the capacitor during charging process in a RC series circuit connected to a dc source.

- ⑥ In the given network the battery voltage is applied for a steady state period. Derive the expression for the current after closing the switch.

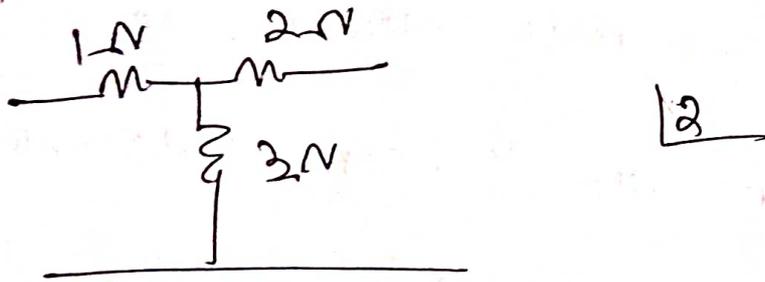


# Assignment Questions

## Chapter-8: Two port networks.

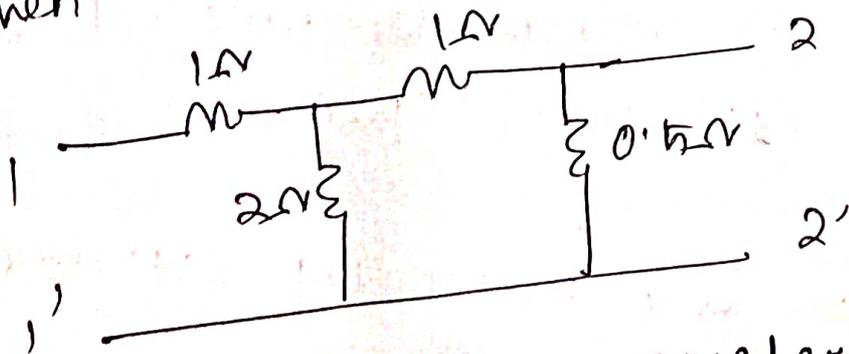
- ① What is two port network. 2
- ② What are the two port network parameters. 2
- ③ Write the condition for symmetry in  
in (a)  $Z$ -parameter 1  
(b)  $Y$ -parameter 1  
(c) transmission (A, B, C, D) parameter 1  
(d) hybrid parameter. 1
- ④ Write down the condition for reciprocity for  
(a)  $Z$ -parameter 1  
(b)  $Y$ -parameter 1  
(c) transmission parameter 1  
(d) hybrid parameter. 1
- ⑤ What is a reciprocal network? 2
- ⑥ Write down the ABCD parameter in matrix form. 2
- ⑦ Write down the equations for  $Y$ -parameter. 2

8) Find the Z-parameter of the following two-port network shown in fig

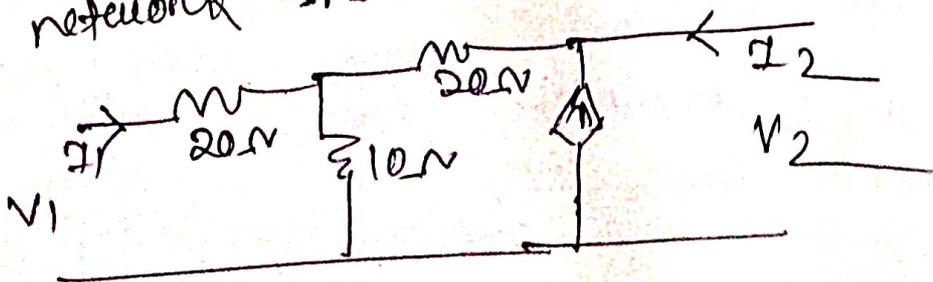


10) A two port network A, B, C, D transmission parameters A, B, C, D & condition for reciprocity is fulfilled. If  $A=1$ ,  $B=-2\Omega$ ,  $C=-1\text{ mho}$  then what will be the value of D? 2

11) Find the Z & Y-parameter of the given network.



12) Determine the Z-parameter of the network shown in the fig.



# Assignment questions

## Chapter-9 Filters

- ① What is filters?
- ② What do you mean by pass band?
- ③ What do you mean by stop band.
- ④ What is the unit of attenuation.
- ⑤ What is the relation between nepers & dB.
- ⑥ Clarify filters as per frequency characteristics 15
- ⑦ What is
  - ① Low pass filter 2
  - ② High pass filter 2
  - ③ Band pass filter 2
  - ④ Band stop filter 2
- ⑧ Design a Band pass filter having design impedance of  $900\Omega$  & cutoff frequencies  $1\text{KHz}$  &  $10\text{KHz}$  15
- ⑨ What is constant-k prototype filter 2
- ⑩ What is m-derived filter 2
- ⑪ Design a m derived T &  $\pi$  network LPF with nominal characteristic impedance  $R_0 = 900\Omega$ , cutoff frequency  $f_c = 0.9\text{KHz}$

Continue  $\rightarrow$

2 resonant frequency  $f_0 = 1 \text{ kHz}$ ,  $Q = 10$

(13) Design a T &  $\pi$  network high pass filter having nominal characteristic impedance  $R_0 = 900 \Omega$ , cutoff frequency  $f_c = 2 \text{ kHz}$  and infinite attenuation  $f_a = 1.8 \text{ kHz}$

(14)