

FE Sem-I (Scheme) Nov. 2025

1/2

Time: 3 hrs

Date: 19/11/2025

Marks: -- 80

Note: - 1) Question No1. is compulsory.

Q.P. Code: 81028

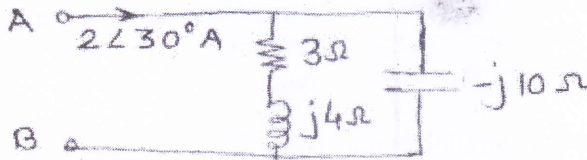
2) Attempt any Three out of remaining.

Q1

Attempt any FOUR

- a) Find current in the capacitor

(20)  
(5)

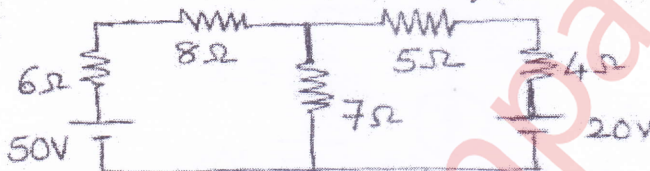


- b) Explain working of any stepper motor (5)  
 c) A current through pure inductor of value 50mH is  $10\sin(314t-20)$  A. Find voltage applied in polar form. (5)  
 d) Find resultant voltage by adding two voltages  $v_1=20\sin(200t-45)$ ,  $v_2=50\cos(200t-\pi/3)$  (5)  
 e) Derive an emf equation of DC machine. (5)

Q2

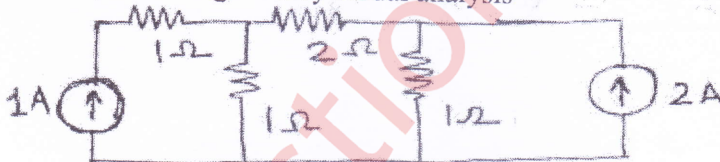
- a) Find current through  $7\Omega$  by mesh analysis.

(10)



- b) The current through  $2\Omega$  by Nodal analysis

(10)



Q3

- a) Find rms and avg value of a given waveform

(10)



- b) A  $100\Omega$  resistor is connected in series with a choke coil. When a 400V, 50Hz, supply is applied to the combination, the voltages across resistance & choke coil are 200V & 300V respectively. Find the power consumed by choke coil. Also, the power consumed by choke coil and pf of complete circuit. (10)

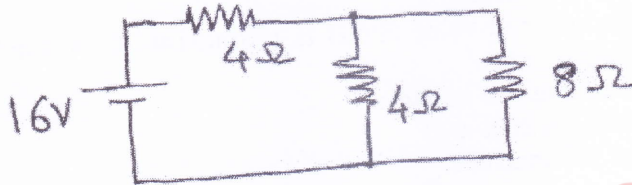
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- Q4 a) Derive relationship between line and phase quantities in a three-phase star connected circuit. (10)
- b) A balanced three phase delta connected load of 200KVA at 0.7pf lag. A voltage of 440V, 50Hz is applied to a circuit. Find circuit constant, active and reactive powers. Also find line and phase current. (10)

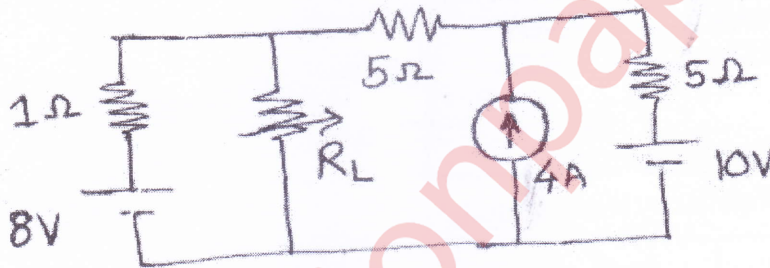
Date: 19/11/2028  
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- Q5 a) Derive an emf equation of single-phase transformer. (5)
- b) Explain the working principle of three phase induction machine. (5)
- c) A resistor & capacitor are connected in series with a variable inductor. When the circuit is connected to a 230V, 50Hz supply, maximum current drawn by varying the inductor is 2A. The voltage across capacitor is then 500V. Calculate resistance and capacitance of the circuit. (10)

- Q6 a) Compare series resonance and parallel resonance. (5)
- b) Find current in  $8\ \Omega$  by Thevenin's theorem. (5)



- c) Find value of  $R_L$  for maximum power transfer and find maximum power transferred. (10)



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