

QP Code : 28587

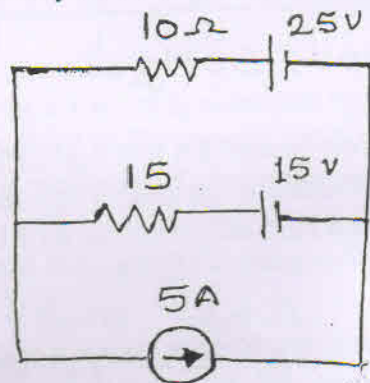
(3 Hours)

[ Total Marks : 80

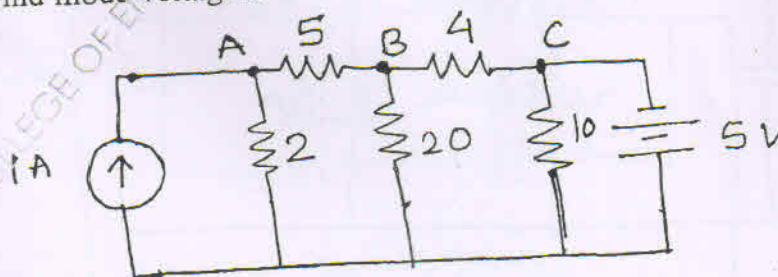
N. B. : (1) Question No. 1 is compulsory.

(2) Solve any three questions from the remaining questions.

1. (a) A resistor of  $5\Omega$  is connected in series with a parallel combination of a number of resistors each of  $5\Omega$ . If the total resistance of the combination is  $6\Omega$  find the no. of resistors connected in parallel. 3
- (b) Use mesh analysis to find current through  $10\Omega$  in the ckt. shown 3



- (c) An alternating voltage is represented by  $v = 141.4 \sin 377 t$  find (i) max-value (ii) frequency (iii) time period 3
- (d) What is the necessary condition for resonance in series circuit. Derive expression for resonance frequency. 3
- (e) What is the relationship between line and phase values in star and delta connected load. 2
- (f) Draw and explain the phasor diagram of 1- $\phi$  transformer on No load. 4
- (g) Define rectifier and state diff. types of it. 2
2. (a) Find node voltages. 6

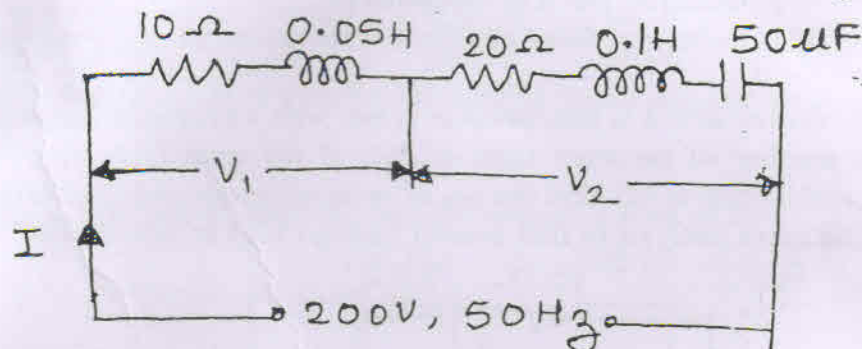


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(b) In the circuit shown find

(i) the current  $I$  (ii)  $V_1$  and  $V_2$  (iii) Pf. Draw the phasor diagram.

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(c) A 150 KVA transformer has iron loss of 1.4 kW and full-load copper loss of 1.6 kW. Det. (i) the KVA load at maximum efficiency (ii) max. efficiency at 0.8 lagging Pf and (iii) efficiency at half load and 0.8 lagging Pf.

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3. (a) A balanced three-phase load connected in delta, draws a power of 10kW at 440 V at a Pf of 0.6 lead, find the values of circuit elements and reactive volt-amperes drawn.

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(b) The wattmeter reads iron losses in OC test and reads copper losses in SC test of a transformer. Justify.

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(c) What is meant by filter.

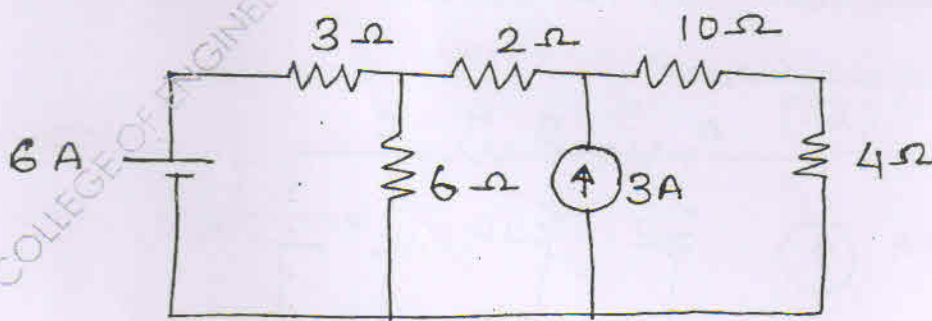
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(d) Draw and explain O/P characteristic of transistor in CE configuration.

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4. (a) Using source transformation tech. calculate voltage across  $4\Omega$

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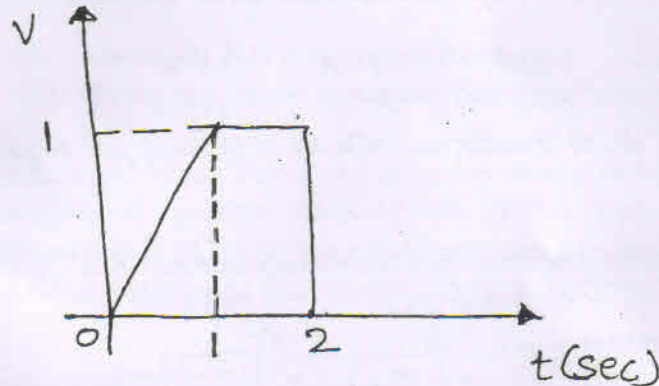


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- (b) Find the average and rms value of the waveform.

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- (c) The power in a 3- $\phi$  ckt is measured by two wattmeters. If the total power is 50kW and Pf is 0.6 lagging, find the reading of each wattmeter.

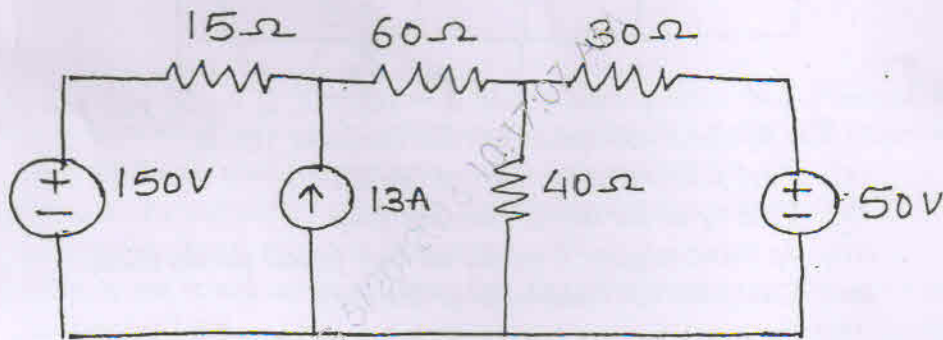
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- (d) Explain the working of centre tapped full wave rectifier.

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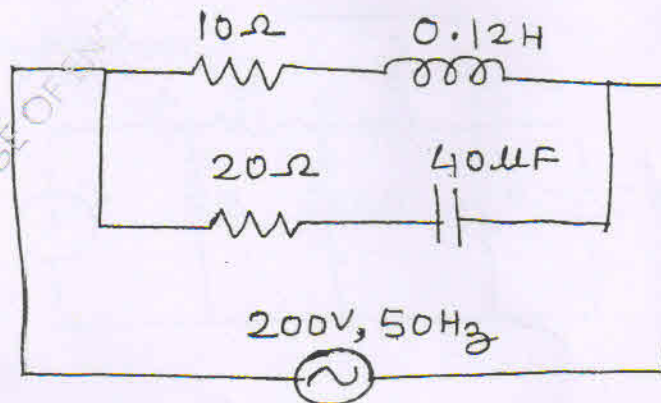
5. (a) Find current through  $30\Omega$  using theveninis theorem

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- (b) For the shown ckt, find supply current, current in each branch and total Pf.

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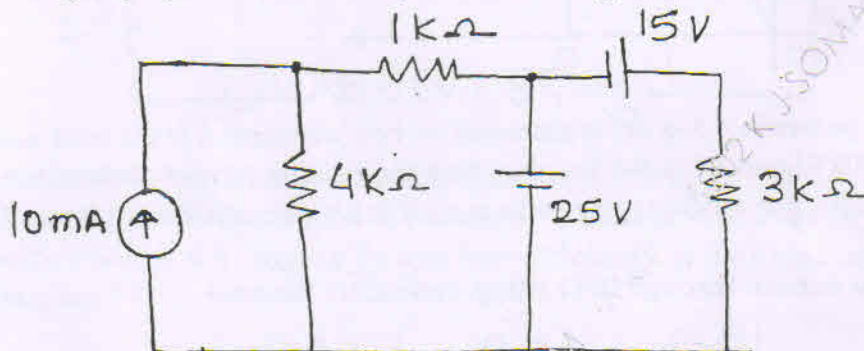
- (c) A 1000/200 V, 50Hz, 1-phase transformer gave the following test results 8

OC test (hv side) : 1000V 0.24 A 90 W

SC test (lv side) : 50V 5A 110W

Draw equivalent ckt of transformer referred to primary and secondary side.

6. (a) Using superposition theorem, find the voltage across  $4K\Omega$  7



- (b) A series R-L-C circuit consists of  $R = 1000 \Omega$ ,  $L = 100 \text{ mH}$  and  $C = 10\mu\text{F}$ . The applied voltage across the circuit is 100 V. 7

- Find the resonance freq of the ckt.
- Find Q of the ckt at resonant freq.
- At what angular freq. do the half power points occur.
- Calculate the bandwidth of the ckt.

- (c) Show that the total power and Pf. in a 3- $\phi$  balanced system can be determined using two wattmeter method. 6

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