FE-sem-I-CBGS-BEE

20/5/16

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 5Ω is connected in series with a parallel combination of a number of resistors each of 5Ω. If the total resistance of the combination is 6Ω find the no. of resistors connected in parallel. **3**

(b) Use mesh analysis to find current through 10Ω in the ckt. shown **3**
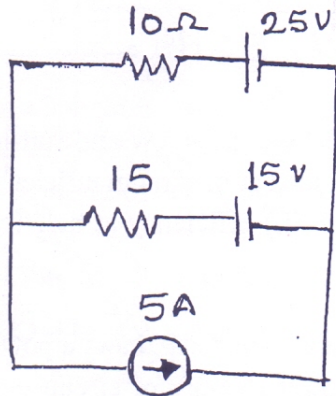
(c) An alternating voltage is represented by $v = 141.4 \sin 377\,t$ find (i) max-value (ii) frequency (iii) time period **3**

(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-φ transformer on No load. **4**

(g) Define rectifier and state diff. types of it. **2**
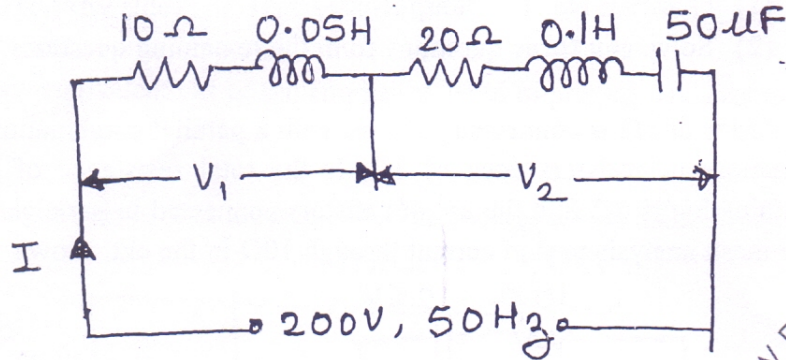
2. (a) Find mode voltages. **6**
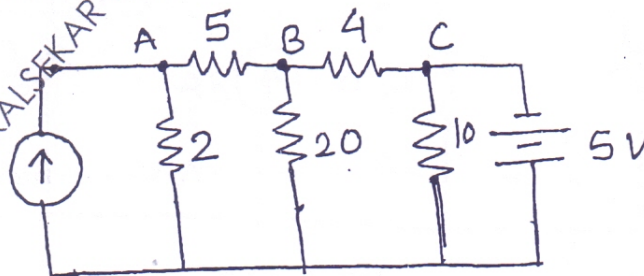
(b) In the circuit shown find   8

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

(c) A 150 KVA transformer has iron loss of 1.4 kW and full-load copper 6
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.

3. (a) A balanced three-phase load connected in delta, draws a power of 10kW 8
at 440 V at a Pf of 0.6 lead, find the values of circuit elements and
reactive volt-ampers drawn.

 (b) The wattmeter reads iron losses in OC test and reads copper losses in 6
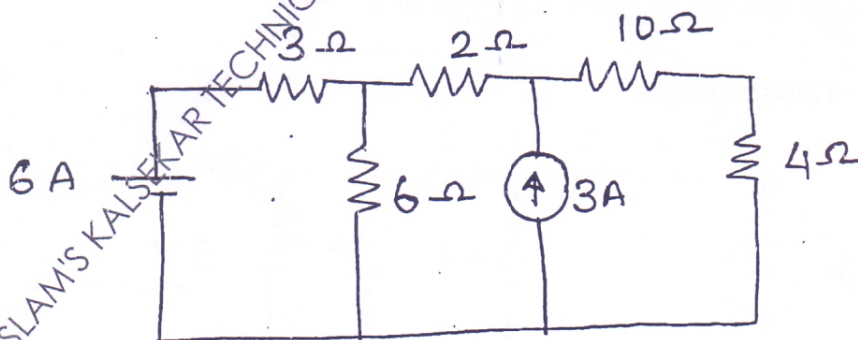SC test of a transformer. Justify.

 (c) What is meant by filter.   2

 (d) Draw and explain O/P characteristic of transistor in CE configuration. 4

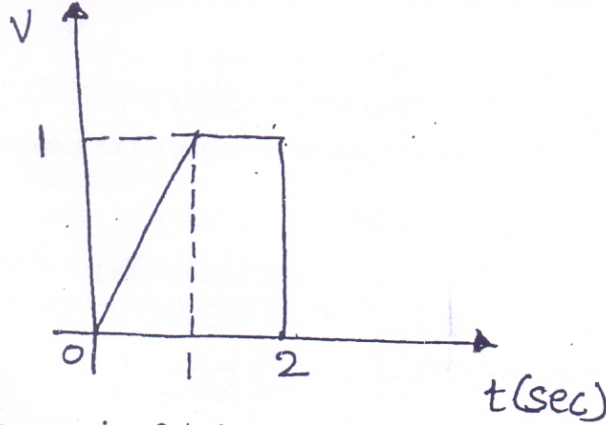4. (a) Using source transformation tech. calculate voltage across 4Ω 7

(b) Find the average and rms value of the waveform.   5

(c) The power in a 3-φ ckt is measured by two wattmeters. If the total power is 50kW and Pf is 0.6 lagging, find the reading of each wattmeter.   4
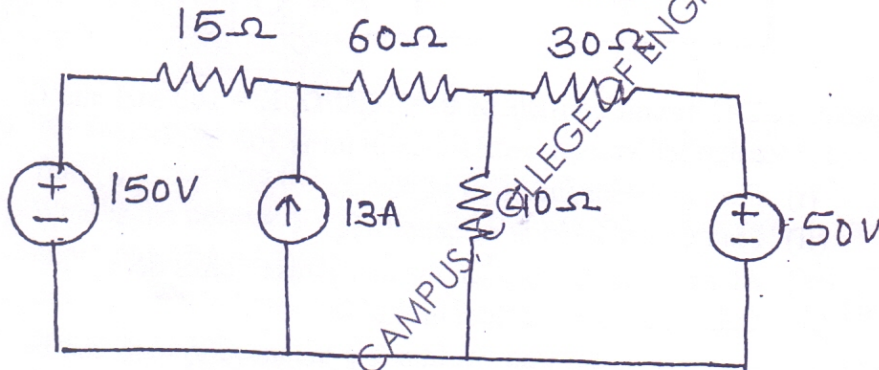
(d) Explain the working of centre tapped full wave rectifier.   4
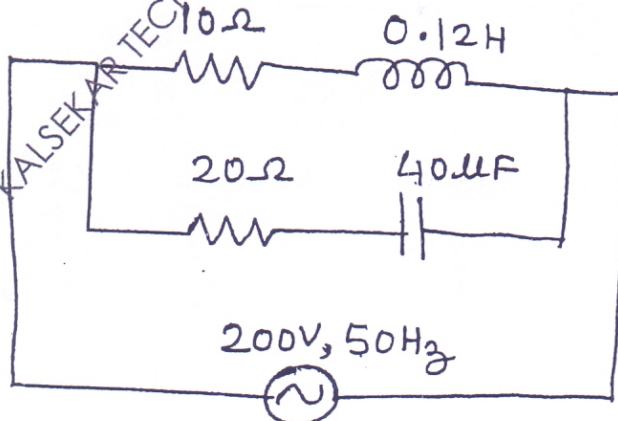
5. (a) Find current through 30Ω using theveninis theorem   8

(b) For the shown ckt, find supply current, current in each branch and total Pf.   4
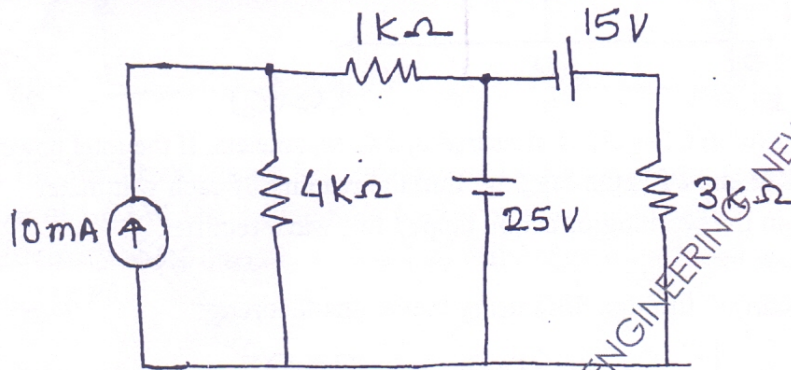
(c) A 1000/200 V, 50Hz, 1–phase transformer gave the following test   8
results
OC test (hv side) :   1000V   0.24 A   90 W
SC test (hv side) :   50V   5A   110W
Draw equivalent ckt of transformer reffered to primary and secondary side.

6. (a) Using superposition theorem, find the voltage across 4KΩ

(b) A series R-L-C circuit consists of R = 1000 Ω, L = 100 mH and C   7
= 10μF. The applied voltage across the circuit is 100 V.
   (i) Find the resonance freq of the ckt.
   (ii) Find Q of the ckt at resonant freq.
   (iii) At what angular freq do the half power points occur.
   (iv) Calculate the bandwidth of the ckt.
(c) Show that the total power and Pf. in a 3-φ balanced system can be   6
determined using two wattmeter method.

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