

14/6/2011

FE SEM-I (RED) Electronics
Basic Electrical & Engineering.
RK-1065

Con. 3382-11.

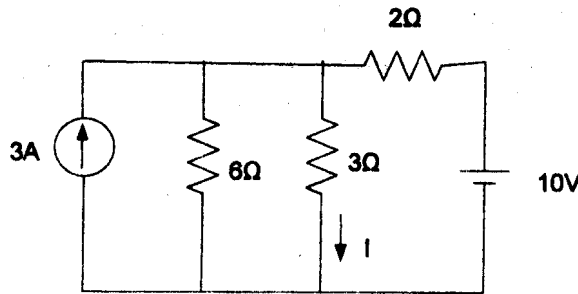
(3 Hours)

[Total Marks : 100

- N.B. :** (1) Question No. 1 is compulsory.
(2) Attempt any four questions from remaining six question.
(3) Assume suitable data if necessary.
(4) Figures to the right indicate full marks.

1 A) Using source transformation find I.

05



B) A voltage of 125V at 50Hz is applied across a non-inductive resistance connected in series with a capacitance. The current is 2.2A. The power loss in resistance is 96.8 watts. Find R and C.

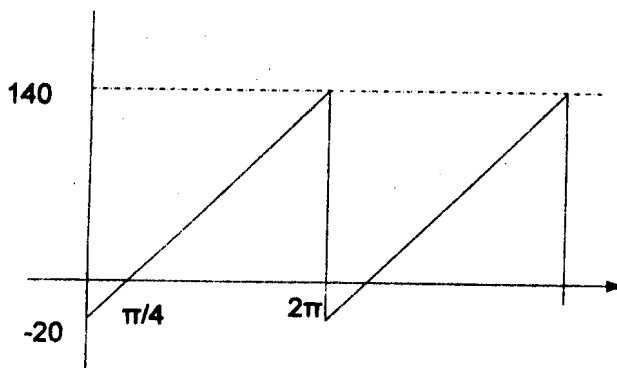
05

C) A 3 phase motor load has a p.f. of 0.397 lagging. Two watt meters connected to measure power show the input as 30KW. Find reading of each watt meter.

05

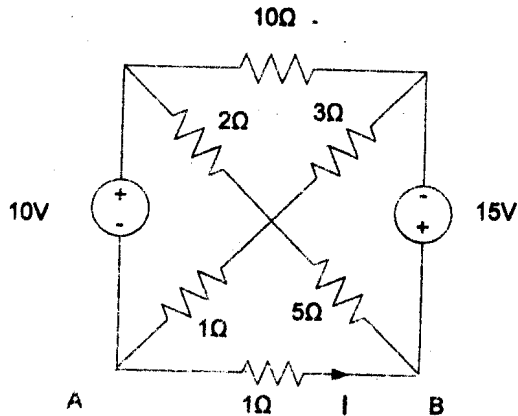
D) Find the average and rms value for the wave form given below.

05



2 A) Using Norton's Theorem find I.

08



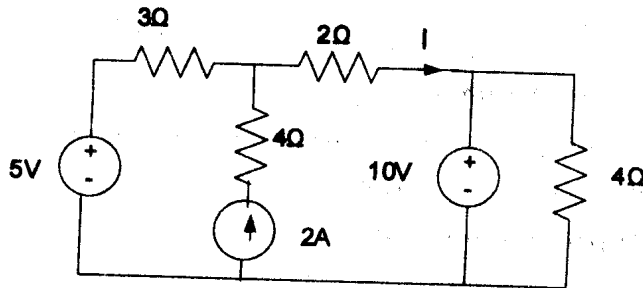
B) Derive the expression for star -delta and vice-versa conversion of three resistances. 06

C) Explain Input and output characteristics of BJT in common emitter configuration. 06

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3 A) Using superposition principle Find I.

08



B) Explain construction, working and characteristic of zener diode.

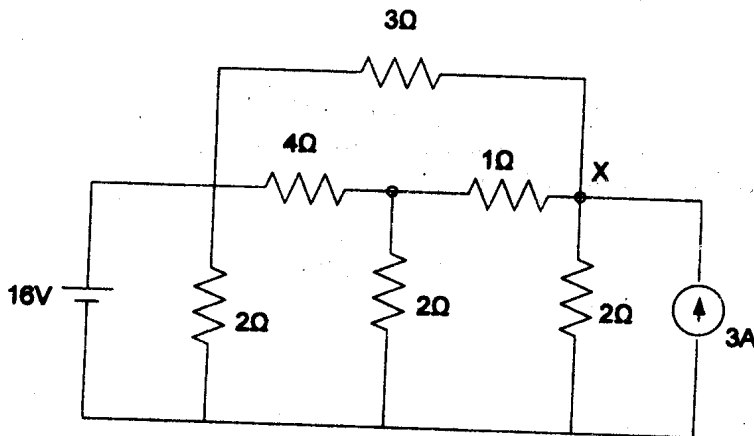
04

C) A series circuit with $R=5\Omega$, $C=20\mu\text{f}$ and a variable inductor has an applied voltage of 10v with frequency of 1000 rad/sec. The inductor is adjusted until voltage across resistance is maximum. Find voltage across each element.

08

4 A) For the circuit below, using nodal analysis, Find voltage at X.

08



B) Each of the star connected load consists of a non-reactive resistance of 100Ω in parallel with a capacitance of $31.8\mu\text{f}$. Calculate the line current, power absorbed, the total KVA and power factor when connected to a 416V, 3 phase, 50Hz supply.

06

C) Explain with help of neat labeled diagram and wave forms, the working of 1 phase rectifier with centre tap transformer.

06

5. (a) A 100 kVA, 1000/10,000V, 50Hz 1-phase transformer has iron losses of 1100 watts the copper loss with 5A in high voltage winding is 400watts. Calculate the efficiency at 25% of full load at (i) UPF (ii) 0.8 lagging pf, the output being maintained at 10,000V.

10

(b) Explain construction of 3 phase induction motor (both types) and state its working Principle.

10

6. (a) Explain how to get the approximate equivalent circuit of 1 phase transformer by open circuit and short circuit test. **12**
- (b) Explain using neat labeled diagram and phasor diagram to show 2 wattmeters can be used to measure power and power factor in a star connected load. **8**
7. (a) Explain double field revolving theory for 1 phase induction motors. Explain any type of split phase induction motor. **10**
- (b) Derive the expressions for resonant frequency, band width, condition for resonance in a series R-L-C circuit. Show variation of R, L, C, Z and current with respect to Frequency. Mark band width also. **10**
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