MARRI LAXMAN REDDY
Institute of Technology and Management
(An Autonomous Institution)
Dundigal, Medchal Dist. Hyderabad - 500043,Telangana.

I B.Tech I Sem Regular Examination, Dec 2019/Jan 2020
BASIC ELECTRICAL ENGINEERING
(EEE, CSE & IT)

Time: 3 Hours.   **Max. Marks: 70**

Note: 1. This question paper contains two parts A and B.
      2. Part- A is Compulsory. Answer all Questions which carries 20 marks.
   3. Part – B consists 5 units. Answer any one question from each unit.
         Each question carries 10 marks and may have a, b as sub questions.

PART- A

(10 x 2 Marks = 20 Marks)

1.	a)	Write the voltage and current equations across capacitor with a DC excitation?	2 M
	b)	Write the initial and final condition for pure inductor supplying with a DC excitation.	2 M
	c)	Define power factor. What is the formula for RL series circuit with AC excitation?	2 M
	d)	Derive the average value of sinusoidal current.	2 M
	e)	Draw the no load characteristics of 1-phase practical transformer.	2 M
	f)	Differentiate between the 1-phase transformer and auto transformer.	2 M
	g)	Why single-phase induction motor is not self-starting?	2 M
	h)	Write the differences between self and separately excited motor?	2 M
	i)	Define fuse and circuit breaker.	2 M
	j)	What is earthing? and what is the importance of earthing?	2 M

PART - B

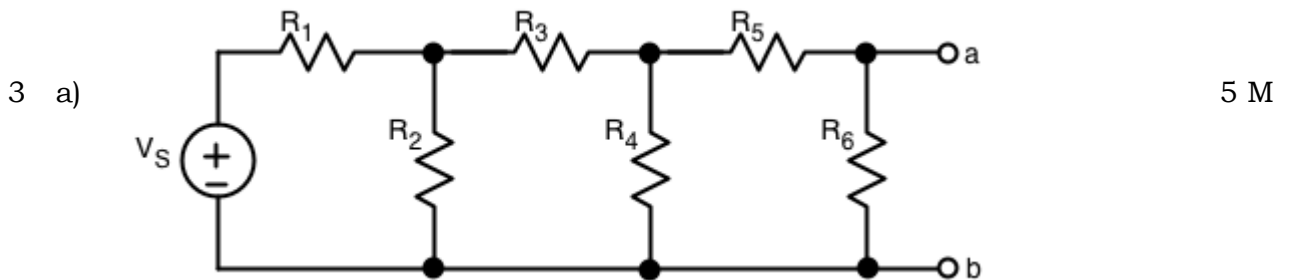**(5 x 10 Marks = 50 Marks)**

Find the equivalent resistance R_{EQ} for the following resistor combination circuit.

2   a)

5 M
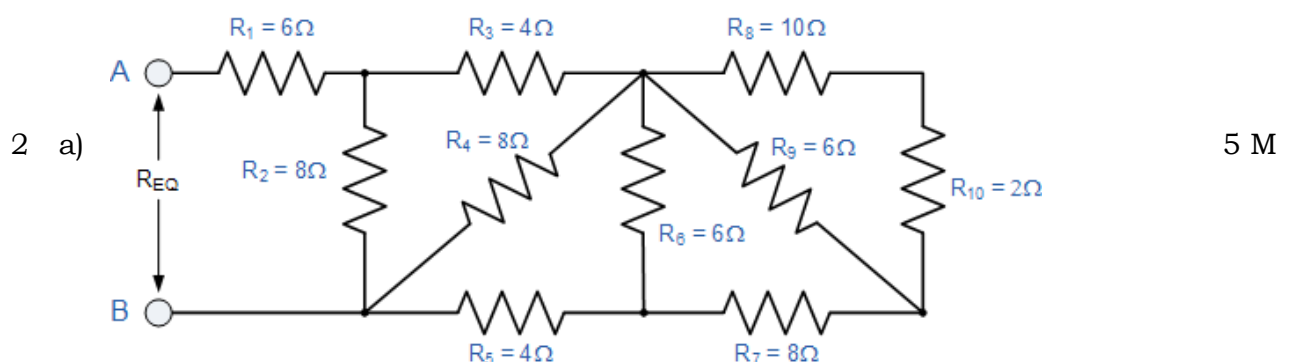
b) State the superposition theory and thevenin's theory.   5 M

For the circuit show below R_1 =6kΩ, R_2 =80kΩ, R_3=4kΩ , R_4 =25kΩ , R_5 =4kΩ , R_6 =45kΩ and V_s =40v find the values for Norton's equivalent circuit respect to the terminals a and b.

3 a)   5 M

Find current 'I' in the below circuit by using Nodal Analysis.

b)   5 M
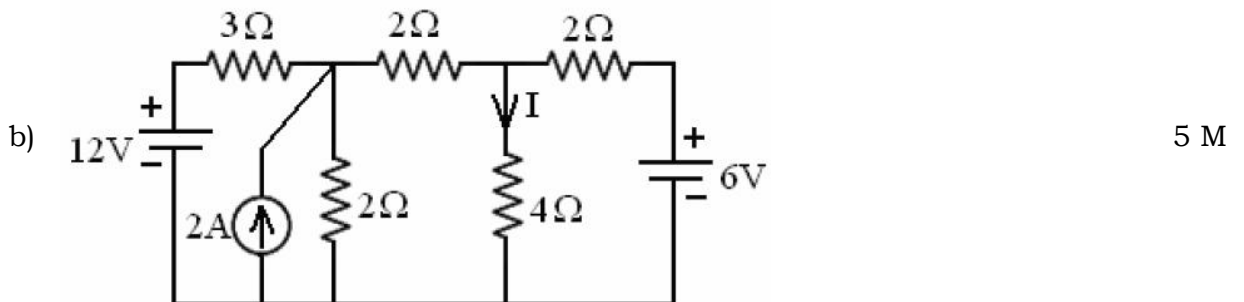
4 a) Derive the equation of impedance, current, phase angle, voltage drop across resistor and capacitor, power factor in a series RC single phase AC circuit.   5 M

Determine the input impedance of the circuit shown in below Figure at ω = 10 rad/s.

b)   5 M

5 a) A balanced star connected load of 8+j6Ω per phase is connected to a 3-phase 230V supply find (i) Line current (ii) Active power (iii) Reactive power (iv) Apparent power.   5 M

b) Derive the relation between line voltages and phase voltages, line currents and phase currents in star connection with phase diagram.   5 M

6 a) Explain the open circuit test and short circuit test on the 1-phase transformer with neat circuit diagrams.   10 M

7 a) Explain the principle of operation of single phase transformer with a neat circuit diagram and derive the transformation ratio.   5 M

b) A 10kVA, 2000/400V single phase transformer has the following data: R1= 5Ω, X1= 12Ω: R2= 0.2 Ω, X2= 0.48Ω. Determine the secondary terminal voltage at full-load, 0.8p.f lagging when the primary supply voltage is 2000V.   5 M

8	a)	Explain the construction details and working principle of 3-phase induction motor with a neat diagram.	10 M

OR

9	a)	Explain the speed control methods of separately excited dc motor	5 M
	b)	What are the starting methods of 3-phase induction motor? explain with neat circuit diagrams.	5 M

10	a)	What are the different types of batteries? explain in detail.	5 M
	b)	Explain the operation of MCB and ELCB components of LT switchgear.	5 M

OR

11	a)	Explain the operation of FSU and MCCB components of LT switchgear.	5 M
	b)	What are the different types of wires and cables? explain.	5 M

---ooOoo---