

B.Tech I Year (R13) Supplementary Examinations December 2019

**BASIC ELECTRICAL & ELECTRONICS ENGINEERING**

(Common to CSE &amp; IT)

Time: 3 hours

Max. Marks: 70

Answer all the questions  
(Use single answer booklet only)

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**PART - A**
**UNIT - I**

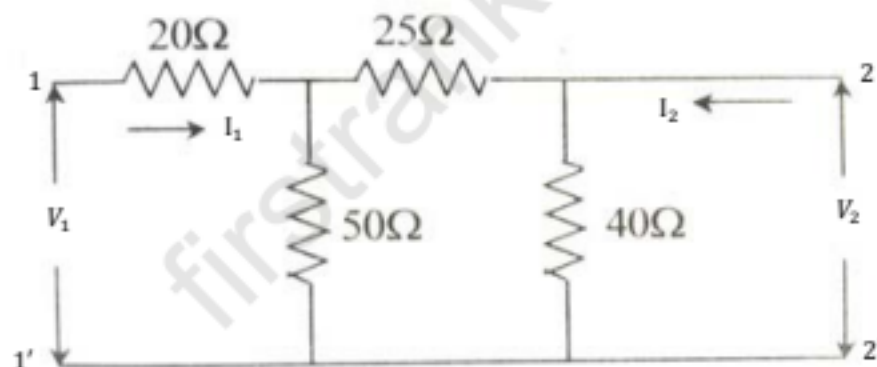
- 1 (a) Write the equation current in a series RLC circuit for step input.
- (b) An unbalanced star load of  $Z_a = 5\Omega$ ,  $Z_b = 5+j5\Omega$  and  $Z_c = j10\Omega$  are connected to a 3-phase 3 wire 106 V system. Find the line currents take phase sequence has ACB.

OR

- 2 (a) Define and explain real power and reactive power in an AC circuit.
- (b) A balanced star connected load of 100 kW is connected to a balanced 3-phase supplied system at 400 V and 50 Hz. The line current is taken from the supply is 150A (lagging). Find the circuit constants.

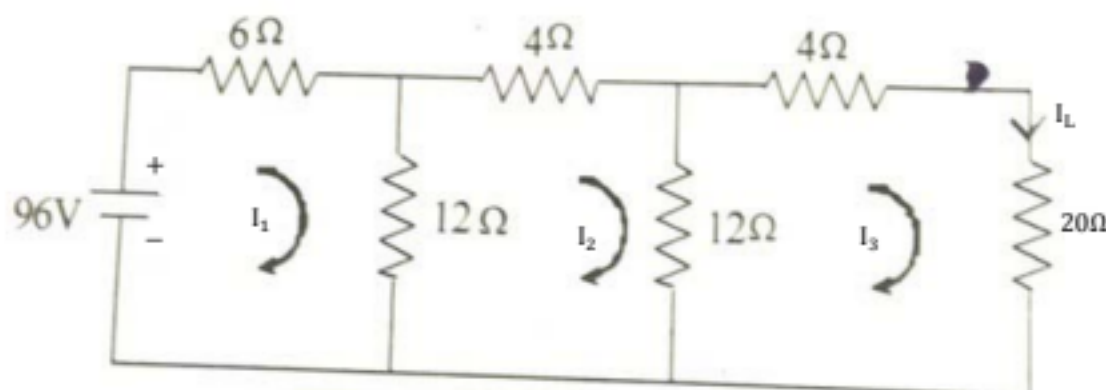
**UNIT - II**

- 3 (a) Write the equations for the two port networks connected in parallel.
- (b) Determine the Y parameters of the network shown in figure below.



OR

- 4 (a) State the Norton's theorem.
- (b) Find the  $I_L$  by Norton's Theorem.



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**UNIT – III**

- 5 (a) Classify the DC machines depending upon types of excitation.  
(b) The power output of a dc shunt generator is 66A at 100 V. The efficiency of the generator at this load is 88 percent. The armature and the shunt field resistance being 0.04 and 24Ω respectively.

Calculate: (i) Copper losses.  
(ii) Iron and friction losses.  
(iii) Shaft power of the driving engine.

**OR**

- 6 (a) Explain the principle of operation of DC generator.  
(b) The power input to a 2000 V, 50 Hz, 3-phase motor running on full load at an of 90% is measured by two watt meters method which indicate 300 kW and 100 kW respectively.

Calculate: (i) The input power.  
(ii) The power factor.  
(iii) The line current.  
(iv) The output power.

**PART – B****UNIT – I**

- 7 (a) Draw the circuit of a full wave rectifier and derive the expression for ripple factor.  
(b) Bring out the differences between semiconductor diodes and Zener diode. Give the applications of Zener diode.

**OR**

- 8 (a) Explain the different current components in a p-n junction diode and hence derive the current equation.  
(b) Distinguish between avalanche and Zener breakdown mechanisms.

**UNIT – II**

- 9 (a) Compare CE, CB and CC transistor configurations.  
(b) Draw an n-channel FET and explain its working.

**OR**

- 10 (a) With relevant diagrams, explain the working of Enhancement MOSFET circuit.  
(b) Explain the input and output characteristics of a BJT CE configuration.

**UNIT – III**

- 11 (a) Draw an LC tuned oscillator using transistors and explain.  
(b) State the Barhausen criteria for oscillator operation.

**OR**

- 12 (a) Explain the working of a differential amplifier. Obtain the expressions for differential gain and common mode gain.  
(b) Mention the characteristics of an Ideal operational amplifier.

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