R18 Regulation *Subject code:* 2E1AD

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

(Autonomous, Accredited by NAAC with 'A' Grade)

B.Tech I Year I Semester Examinations, December 2019

BASIC ELECTRICAL ENGINEERING

(Common to CE,EEE,ME & IT)

Maximum Marks: 70 Date: 23.12.2019 Duration: 3 hours

Note: **1.This question paper contains two parts A and B.**
2. Part A is compulsory which carries 20 marks. Answer all questions in Part A.
3. Part B consists of 5 Units. Answer any one full question from each unit.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

All the following questions carry equal marks **(10x2M=20 Marks)**

1 Two resistances of 4 Ω and 6 Ω are connected in parallel across 10V battery. Determine the current through 6 Ω resistance.

2 State Kirchhoff current and voltage laws

3 Define peak and form factor.

4 Three inductive coils each with resistance of 15 Ω and an inductance of 0.03 H are connected in star to 3 phases 400V, 50 Hz supply. Calculate the phase voltages

5 State reciprocity theorem.

6 What is the condition for Maximum power transfer in DC circuits?.

7 A DC generator supplies load of 10 KW at 220V through feeders of resistance 0.1 Ω.The resistances of armature and shunt field windings is 0.05 Ω and 100 Ω respectively. Calculate the terminal voltage

8 In a single phase transformer Np=350 Turns,Ns = 1050 Turns and Ep= 400 V. Find Es

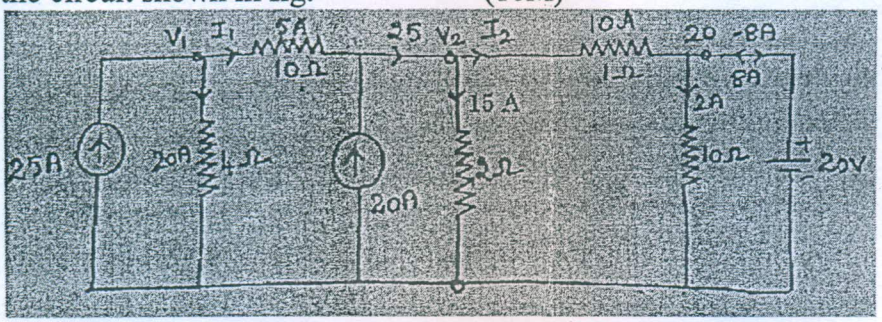
9 Define power factor and list out the methods for power factor improvement.

10 What is the function of MCCB?

Part-B

Answer All the following questions. **(10M X 5=50Marks)**

11 Using nodal analysis find the node voltages and the currents through all the resistors for the circuit shown in fig. (10M)



OR

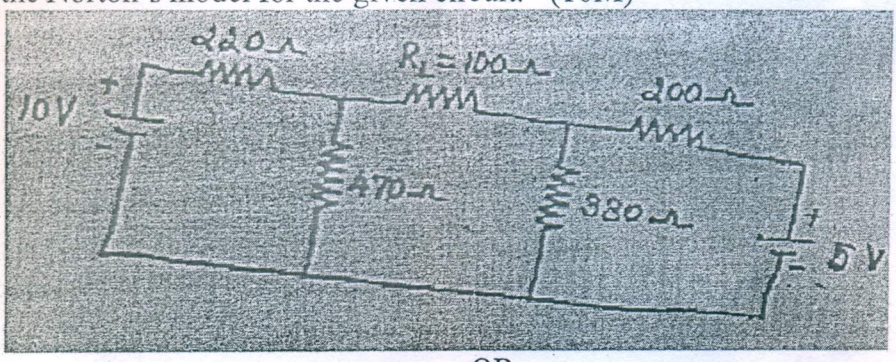
12 i) Explain the various types of magnetic materials. (5M)
ii) Derive the expressions for Mutual inductance. (5M)

13 Derive the expressions for single phase RLC series and RLC parallel circuits. (10M)

OR

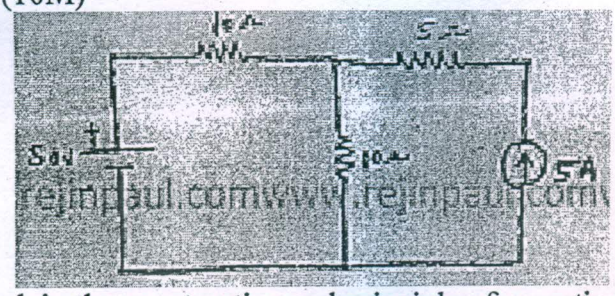
14 Three equal impedances each of 8+j10 Ω are connected in star. This is further connected to 440V , 50 Hz three phase supply .Calculate the active power , reactive power , line currents and phase currents. (10M)

15 Obtain the Norton's model for the given circuit. (10M)



OR

16 Find the current through various branches of the circuit shown below by employing superposition theorem. (10M)



17 With a neat diagram explain the construction and principle of operation of single phase transformer. What are the characteristics of an ideal transformer? (10M)

OR

18 Derive the EMF and Torque equation of a DC Motor. (10M)

19 Explain in detail about various types of batteries used for electrical applications. (10M)

OR

20 Explain in detail about MCB and ELCB with neat diagram. (10M)