R18 Regulation *Subject code:2E2AJ*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech II Semester Supplementary Examinations, October 2022

BASIC ELECTRICAL ENGINEERING

(Common to ECE & CSE)

Maximum Marks: 70 Date:18.10.2022 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 which carries 10M.
4. Each question carries 10 marks and may have a, b, c, d as sub questions.

Part-A

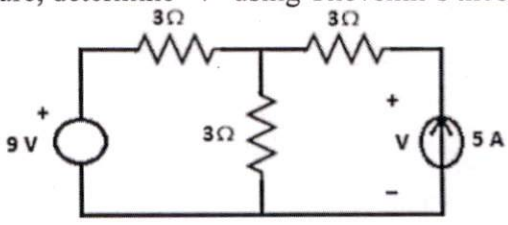
All the following questions carry equal marks (10x2M=20 Marks)

1 Define linear and non linear elements.
2 What is complex power?
3 Define resonance
4 What is j operator? Explain its significance?
5 State Thevenin's theorem.
6 List the limitations of Norton's theorem?
7 Define EMF equation for DC generator.
8 Why the copper losses are more in a transformer?
9 What is MCB?
10 What is the necessity of earthing in domestic buildings?

Part-B

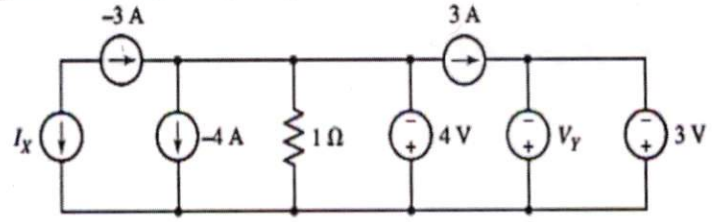
Answer All the following questions. (5X10M=50Marks)

11 a) State and explain Thevenin's theorem.
b) In the circuit shown in figure, determine 'V' using Thevenin's theorem. [5+5]



OR

12 State Kirchhoff Current Law and Voltage law, determine the values for I_X and V_Y in the following given circuit shown in figure. [10]



13 a) Explain the concept of Average value and RMS value.

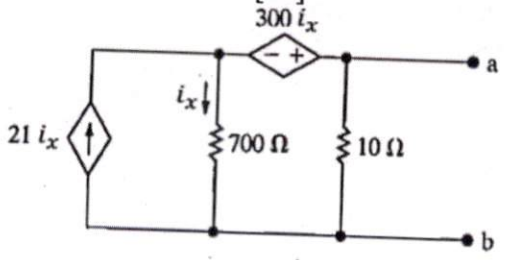
b) An alternating current varying sinusoidally, with a frequency of 50Hz, has an rms value of 20A. Write down the equation for the instantaneous value and find this value at (i) 0.0025s, (ii) 0.0125s after passing through a positive maximum value. At what time, measured from a positive maximum value, will instantaneous current be 14.14A? [5+5]

OR

14 a) Explain following terms: i) Impedance ii) admittance iii) susceptance iv) conductance v) Power factor?

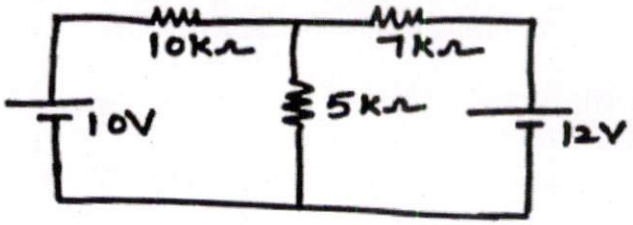
b) State and explain balanced three phase system in Star connected and derive the relationship between voltage and current? [5+5]

15 Find the Norton equivalent circuit of the following given circuit shown in figure with respect to the terminals 'a-b'? [10]



OR

16 Using method of superposition, determine the current through the 5kΩ resistors for the circuit in figure. [10]



17 Derive the torque equation of dc motor. [10]

OR

18 Explain construction and working principle of single-phase transformer. [10]

19 a) What is ELCB? Explain the working principle of ELCB.

b) Mention advantages and disadvantages of ELCB. [5+5]

OR

20 a) What are the different types of wires and cables? Explain.

b) Give applications of the primary and secondary batteries. [5+5]