R22 Regulation *Subject code: 4E1AI*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Regular Examinations, March/April 2023

FUNDAMENTALS OF ELECTRICAL ENGINEERING

(ELECTRONICS & COMMUNICATION ENGINEERING)

Maximum Marks: 60 Date:06.04.2023 Duration: 3 hours

Note: 1.This question paper contains two parts A and B.
2. Part A is compulsory which carries 10 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 (10x1M=10 Marks)

1. a State Thevenin's theorem.
   b Differentiate between active and passive elements.
   c Define R.M.S and Average value.
   d Draw the 3 phase balanced circuit.
   e Define transformer, ideal and practical transformer.
   f What is an auto transformer write its advantages?
   g What is the principle of operation of DC Generator?
   h What is the working principle of a three-phase induction motor?
   i What are the characteristics of batteries for longer life?
   j What is the difference between fuse unit and switch fuse unit?

Part-B

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

2 A. Explain mesh analysis procedure with example. [5M]
B. Find the equivalent resistance Rab in the circuit shown in Fig. [5M]

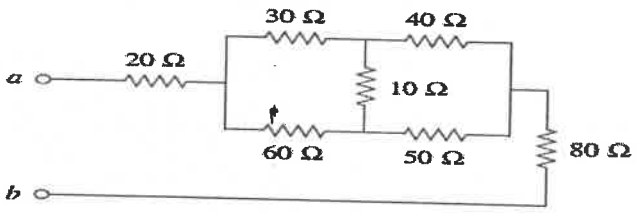

Fig.

OR

3 State and explain Superposition theorem with neat circuits. [10M]

4 Construct and explain the working principle operation of single phase transformer and also derive the E.M.F equation [10M]

OR

5 Derive rms value and average value of Sinusoidal voltage input. [10M]

6 A. Explain properties of ideal transformer. [5]
B. Discuss the open circuit test and short circuit test on single phase transformer with neat diagrams [5M]

OR

7 A. Explain the operation of an auto transformer with a neat diagram. [5M]
B. Write the no-load operation of single-phase Transformers? [5M]

8 Explain the construction and working principle of DC Generator? [10M]

OR

9 Describe briefly construction details of any three phase Induction motor. [10M]

10 A. What is ELCB? Explain the working principle of ELCB. [5M]
B. Mention advantages and disadvantages of ELCB. [5M]

OR

11 Explain the following

A. Important characteristics of battery [5M]

B. Difference between MCB and MCCB [5M]