Regulation R22 *Subject code: 4E1AI*

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

B.Tech I Semester Supplementary Examinations, September 2023

FUNDAMENTAL OF ELECTRICAL ENGINEERING

(ECE)

Maximum Marks: 60 Date:30.09.2023 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

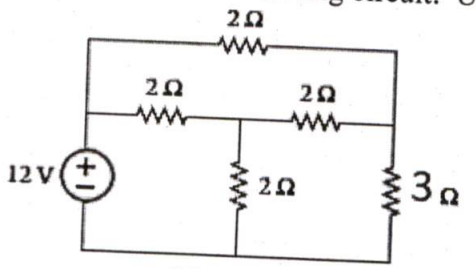
All the following questions carry equal marks (10x1M=10 Marks)

1.a State Kirchhoff's current law.
b Draw the Thevenins equivalent circuit.
c Modify the following rectangular quantities into polar.20+j30
d Define form factor
e Define ideal transformer
f What is an auto transformer
g Define motor
h Define slip
i What is MCB
j List the types of cables.

Part-B

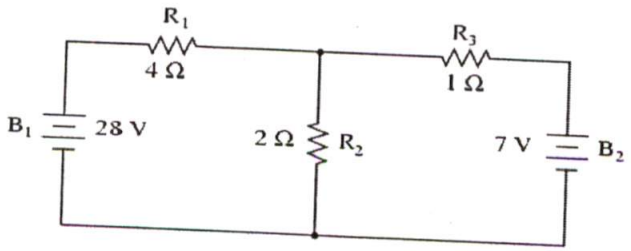
Answer All the following questions. (5X10M=50Marks)

2 Determine current through each resistor for the following circuit. Using nodal analysis 10M



OR

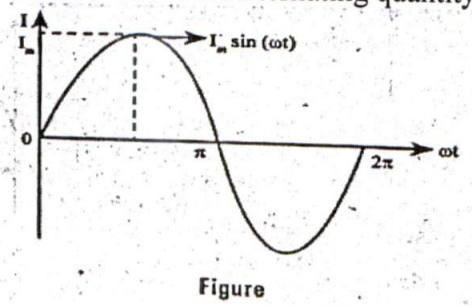
3 Measure current through the 2 Ω resistor Using Superposition Theorem 10 M



4 Define the following terms 10M
i) Sinusoidal voltage &currents ii) Cycle and period iii) Frequency
iv) Peak and instantaneous values v) Lagging and leading vi) Phase difference

OR

5 Derive the RMS value of an alternating quantity for sine wave shown in fig below. 10M



Figure

6 Discuss the open circuit and short circuit test on single phase transformer and the following readings are obtained from OC and SC tests on 8KVA 400/120volts , 1- phase 50Hz transformer , 10M

O.C test: 120V, 4A, 75W, S.C test: 9.5v, 20A, 110W

Calculate : i) Equivalent circuit constants

ii) Voltage regulation and efficiency for 0.8 lagging p.f, full load

OR

7 Explain about losses in a single-phase transformer 10M

8 Derive back E.M.F equation of DC motor. 10M

OR

9 With a neat sketch explain about the construction and working principle operation of single phase induction motor. 10M

10 a) Explain the following 5M

i) Switch fuse unit ii) Cable iii) Important characteristics of battery

b) Compare the Difference between MCB and MCCB 5M

OR

11 Explain the Types of Batteries and write the Important Characteristics for Batteries 10M