



R20 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

Subject code:3P3CB

B.Tech III Semester Regular Examinations, February 2022
BASIC ELECTRICAL ENGINEERING

(MECHANICAL ENGINEERING)

Maximum Marks: 70

Date:22.02.2022 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.
 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 State Kirchoff's voltage law.
- 2 Explain at condition the maximum power is transfer to the load.
- 3 Define average and RMS value.
- 4 A 410V is applied to three phase star connected identical impedances each containing of a 5Ω resistance in series with 2Ω inductive reactance. Find line current.
- 5 What is the function of auto transformer?
- 6 List out the losses in the transformer.
- 7 Write short notes on Back EMF.
- 8 List out the difference between slip ring and squirrel cage induction motor.
- 9 What is the need of power factor improvement?
- 10 List out the various characteristics of battery.

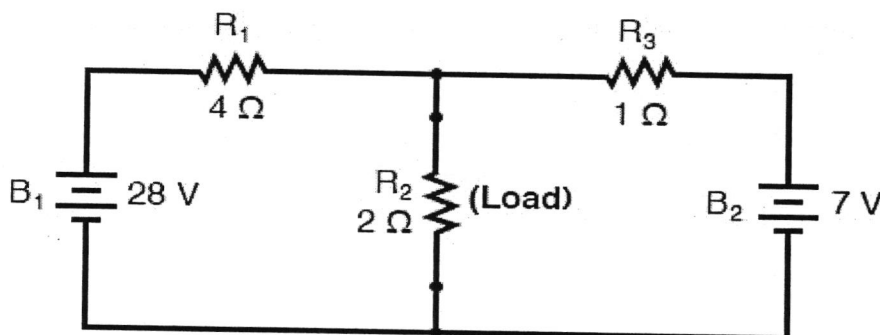
Part-B

Answer All the following questions.

(5X10M=50Marks)

- 11 Find the current 'I' through 2Ω resistor using Thevenin's theorem of the network shown in fig.

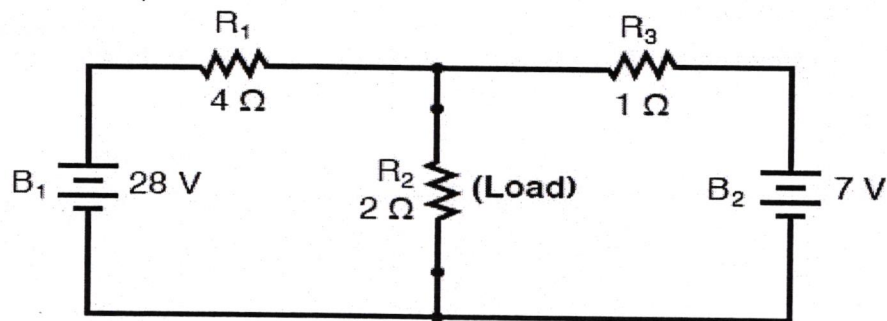
10M



OR

- 12 Using Superposition theorem find the current flowing through 'R2' of the circuit shown in fig. using nodal analysis.

10M



- 13 a) A series R-C circuit with $R = 30\Omega$ and $C = 125 \mu\text{F}$ has 150 V, 50 Hz supply connected to it. Find the impedance, current and power factor. 6M
 b) Derive the expression for Peak and Form factor of AC supply. 4M
- OR
- 14 a) What is three phase circuit? The load in each branch of star connected three phase circuit consists of 20Ω resistance, 0.07H inductance in series and phase voltage 415V. Find the line voltage and the phase current. 6M
 b) Draw the Phasor diagram and derive the equation for RL Circuits. 4M
- 15 Explain the equivalent circuit of single phase transformer in detail with neat diagram 10M
- OR
- 16 Explain the various types of three phase transformer in detail with neat diagram. 10M
- 17 Explain the construction and working principle of synchronous generator in detail with neat diagram. 10M
- OR
- 18 a) Derive the EMF equation of DC Generator. 5M
 b) Explain the torque speed characteristic of single-phase induction motor with neat diagram. 5M
- 19 Explain the basic concepts of wiring and earthing in detail with neat diagram. 10M
- OR
- 20 a) Describe in detail about MCCB with neat diagram. 6M
 b) Describe in detail about SFU with neat diagram. 4M