



R20 Regulation

TKR COLLEGE OF ENGINEERING AND TECHNOLOGY

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

Subject code:3P3CB

B.Tech III Semester Regular/Supplementary Examinations, March/April 2023

BASIC ELECTRICAL ENGINEERING (MECHANICAL ENGINEERING)

Maximum Marks: 70

Date:29.03.2023 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

- 1 State superposition theorem.
- 2 Write the short notes on nodal analysis.
- 3 Define form factor.
- 4 What is the difference between resistance and impedance?
- 5 Write the EMF equation of a single-phase transformer.
- 6 What are the losses in transformers?
- 7 List the factors affecting EMF generated in DC machine.
- 8 What is meant by back emf in a motor?
- 9 What is the importance of wiring system?
- 10 List the characteristics of ELCB.

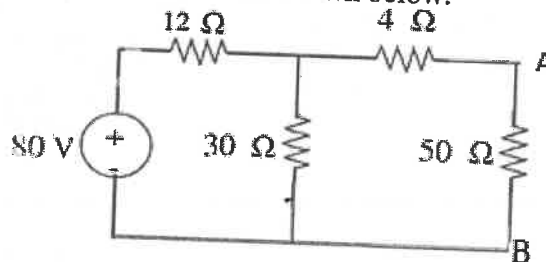
(10x2M=20 Marks)

Part-B

Answer All the following questions.

- 11 Find the Thevenin's equivalent for the circuit shown below.

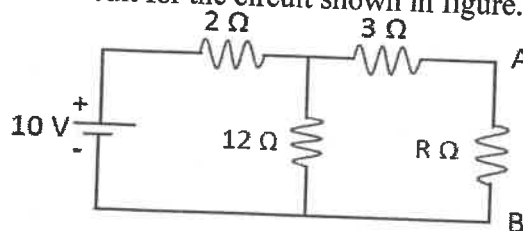
(5X10M=50Marks)
10M



OR

- 12 Draw the Norton's equivalent circuit for the circuit shown in figure.

10M



- 13 Derive an expression for the current and impedance for a series RL circuit excited by a sinusoidally alternating voltage. Draw the phasor diagrams. 10M
- OR
- 14 A) Define power factor, apparent power, active power and reactive power. 4M
 B) A series circuit consisting of a $10\ \Omega$ resistor, a $100\ \mu\text{F}$ capacitor and a 10mH inductor is driven by a 50Hz AC voltage source of maximum value 100 volts. Calculate the equivalent impedance, current in the circuit and the phase angle. 6M
- 15 Draw the constructional diagram of a single-phase transformer and explain all the parts. 10M
- OR
- 16 Explain the open circuit test on a single-phase transformer and develop an equivalent circuit. 10M
- 17 A) Derive the EMF equation of a DC generator. 6M
 B) What are the losses occurring in a DC Generator? 4M
- OR
- 18 Explain the constructional details of DC machine with neat sketch. 10M
- 19 A) What is Earthing? Explain plate earthing in detail. 5M
 B) Compare Fuse & Circuit breaker based on various aspects. 5M
- OR
- 20 Describe the construction and working of a lead acid battery. 10M