

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-I & II(NEW) EXAMINATION – WINTER 2022

Subject Code:3110005

Date:13-03-2023

Subject Name:Basic Electrical Engineering

Time:10:30 AM TO 01:00 PM

Total Marks:70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.
4. Simple and non-programmable scientific calculators are allowed.

	Marks
Q.1 (a) State and explain Kirchoff's current Law	03
(b) Draw the construction of single phase core type transformer	04
(c) Derive an expression for equivalent resistances of a Delta connected network to transform into a Star connected network.	07
Q.2 (a) Prepare a list of parts of a Single phase AC Motor.	03
(b) When three resistances of 10Ω , 20Ω , and 30Ω are connected in series across 230 V supply. Find (1) equivalent resistance (2) current flowing through each resistance, (3) voltage drop across each and (4) power loss in each resistor	04
(c) Describe phenomena of series resonance in R-L-C series circuit.	07
OR	
(c) Prove that the average power consumption in a pure inductive circuit is zero.	07
Q.3 (a) Write statement of Superposition, Thevenin's and Norton's Theorems.	03
(b) Derive an emf equation of single phase transformer	04
(c) Define following terms in connection with A.C wave forms : (i) Frequency (ii) Time period (iii) Instantaneous value (iv) Peak factor (v) form factor (vi) R. M. S. Value and (vii) Average Value	07
OR	
Q.3 (a) Write short note on autotransformer	03
(b) Compare series and parallel RLC circuit resonance	04
(c) Discuss how the rotating magnetic field is produced in three phase induction motor	07
Q.4 (a) State types of single phase split phase induction motor	03
(b) Explain Working of capacitor start Single phase induction motor	04
(c) List the various parts of DC Motor and explain each	07
OR	
Q.4 (a) Define with equation Active, reactive and apparent power in AC circuit	03
(b) What is power factor? State the methods of power factor improvement	04
(c) Prove that the sum of readings of two watt meters connected to measure power in three phase circuit gives total power consumed by the circuit	07
Q.5 (a) Discuss the difference between MCB and Fuse	03
(b) Compute the monthly energy charges for an air conditioner having Power consumption of 3 kW and daily uses 10 hours. Energy charges Rs. 5 per unit	04
(c) Explain Working of Earth Leakage Circuit Breaker (ELCB).	07

OR

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| Q.5 | (a) Draw the structure of underground cable with name of all sections. | 03 |
| | (b) Explain construction of 3-phase induction motor with diagram | 04 |
| | (c) Briefly describe pipe earthing | 07 |

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