# GUJARAT TECHNOLOGICAL UNIVERSITY
## BE - SEMESTER– III (New) EXAMINATION – WINTER 2019

**Subject Code: 2130105**                                    **Date: 3/12/2019**

**Subject Name: Electrical Machines & Electronics**

**Time: 02:30 PM TO 05:00 PM**                              **Total Marks: 70**

**Instructions:**
1. **Attempt all questions.**
2. **Make suitable assumptions wherever necessary.**
3. **Figures to the right indicate full marks.**

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|---|---|---|---|
| **Q.1** | **(a)** | Explain the DeMorgan's theorems in Boolean algebra. | **03** |
| | **(b)** | Compare Lap and Wave type Winding | **04** |
| | **(c)** | Explain the constructional features of (i) Current Transformer (ii) Potential Transformer and List the advantage and disadvantage of the instrument transformer | **07** |
| | | | |
| **Q.2** | **(a)** | List and Explain any three parts of a D.C. Machine. | **03** |
| | **(b)** | Derive Torque equation of D.C. Motor. | **04** |
| | **(c)** | Sketch and Explain the Torque- Armature Current, Speed- Armature Current and Speed- Torque characteristics of D.C. Series Motor. | **07** |
| | | **OR** | |
| | **(c)** | Draw and Explain External and Internal Characteristics of D.C. Generator. | **07** |
| **Q.3** | **(a)** | Explain the term Slip of Induction Motor. | **03** |
| | **(b)** | List the difference between Squirrel cage and Slip ring Rotor. | **04** |
| | **(c)** | Discuss the need of a starter for a 3 – phase Induction motor. Write the names of various starters used for a 3 – phase Induction Motor. explain any one. | **07** |
| | | **OR** | |
| **Q.3** | **(a)** | Draw and compare Shell type, Core type and Berry type transformer. | **03** |
| | **(b)** | Derive EMF equation of a transformer. | **04** |
| | **(c)** | What is Power factor? Discuss the effect of low power factor and mention their method of Improvement. | **07** |
| **Q.4** | **(a)** | Explain the term Armature Reaction. | **03** |
| | **(b)** | Give Difference between Salient and Smooth Cylindrical Type of Rotor | **04** |
| | **(c)** | Explain Construction of 3 – Phase Alternator with figure. | **07** |
| | | **OR** | |
| **Q.4** | **(a)** | What is Substation? Show Classification of Substation. | **03** |
| | **(b)** | Write Short notes on equipments used in substations. | **04** |
| | **(c)** | Differentiate between Overhead and Underground System with merits and demerits. | **07** |
| **Q.5** | **(a)** | Explain Pole Mounted Substations. | **03** |
| | **(b)** | Draw Pin diagram of 8085 Microprocessor. | **04** |
| | **(c)** | Explain and Compare Half wave and Full wave rectifier. | **07** |
| | | **OR** | |
| **Q.5** | **(a)** | State ideal Characteristics of an Op-amp. | **03** |
| | **(b)** | Define given terms <br> (1) $I_{DC}$ (2) $V_{DC}$ (3) Ripple Factor (4) Rectifier Efficiency. | **04** |
| | **(c)** | Draw Block diagram of 8085 Microprocessor. | **07** |

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