

**Instructions:**

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

- Q.1** (a) Explain the Principle of Electromechanical Energy Conservation. **03**  
 (b) List the similarity and Dissimilarity of singly excited Magnetic system and Doubly Excited Magnetic System. **04**  
 (c) Derive the generated EMF in a short pitched Coil in Electrical Rotating Machine. **07**
- Q.2** (a) Draw and List the different Methods of Excitation in DC Machine. **03**  
 (b) Draw and Explain in brief the Energy Loss diagram of DC Motor and DC Generator. **04**  
 (c) Draw and Explain Working Principle of DC Motor with Concept of back EMF. **07**
- OR**
- (c) Derive the Torque Equation of DC Motor. Explain the significance of each Variable. **07**
- Q.3** (a) Explain the Working Principle of Transformer with necessary diagram. **03**  
 (b) Draw and Explain OC and SC Test of Transformer. **04**  
 (c) List the various types of Three Phase Transformer Connection and draw vector diagram for each of groups. **07**
- OR**
- Q.3** (a) List and Explain in brief about parts of Power Transformer. **03**  
 (b) Explain the Polarity Test of Transformer using suitable example. **04**  
 (c) Write a Technical Short Note on Autotransformer. **07**
- Q.4** (a) Define Measurement. Explain the Methods of Measurement. **03**  
 (b) List and Explain the Classification of Instruments System. **04**  
 (c) Explain measurement of three phase power using three wattmeter method. **07**
- OR**
- Q.4** (a) Define Seeback Effect. Explain basic of Thermocouple. **03**  
 (b) List the different types of Errors and Explain in brief. **04**  
 (c) Draw and explain working principle of Electrostatic Ammeter and Voltmeter. **07**
- Q.5** (a) Define Resistance. List the method for measurement of Low, Medium and High Resistance. **03**  
 (b) Write a Technical Note on Q Meter. **04**  
 (c) Draw and Explain Block Diagram of Digital Voltmeter. **07**
- OR**
- Q.5** (a) Explain the concept of Digital Measurement using suitable example. **03**  
 (b) Write a Technical Note on Harmonic Analyzer. **04**  
 (c) Explain the Measurement of Inductance and Capacitance using AC Bridge. **07**

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