**Code No.PC405EE**

**METHODIST COLLEGE OF ENGINEERING & TECHNOLOGY**

**(An Autonomous Institution)**

**B.E. (EEE) IV-Semester (AICTE) Regular Examination, AUGUST-2023**

**Subject: ELECTRICAL MACHINES-I**

**Time: 3 hours Max.Marks:60**

**Note: Missing data, if any, maybe suitably assumed.**

**PART-A**

**Answer All the questions.(10X2M=20M)**

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| **Q.No.** | **Questions** | **Marks** | **CO** | **BTL** |
| **1. a** | Explain the following terms related to rotating electrical machines.  1.Lenz's Law 2. Fleming left hand rule. | **2M** | **1** | **1** |
| **b** | Define Pitch Factor | **2M** | **1** | **2** |
| **c** | What features of DC Series generator distinguish it from other types of DC generators? | **2M** | **2** | **1** |
| **d** | Define commutation? | **2M** | **2** | **2** |
| **e** | Explain why a dc motor should not be started direct on line. | **2M** | **3** | **1** |
| **f** | Will the transformer draw any current from the source when secondary is open? | **2M** | **3** | **2** |
| **g** | Distinguish between step-up and step-down transformers? | **2M** | **4** | **2** |
| **h** | Draw the phasor diagram for actual transformer on no-load? | **2M** | **4** | **1** |
| **i**  **j** | What are the advantages of single three phase transformer unit over a bank of single-phase transformers?  Distinguish between autotransformer and ordinary 2-winding transformer in brief? | **2M**  **2M** | **5**  **5** | **1**  **1** |

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**PART-B**

**Answer Any Five questions**.**(5X8M=40M)**

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| **Q.No.** |  | **Questions** | **Marks** | **CO** | **BTL** |
| **2.** | **a** | Explain in detailed about Principle of Energy Conversion. | **4M** | **1** | **3** |
| **b** | Explain Faraday’s Laws of Electro Magnetic Induction in detail | **4M** | **1** | **3** |
| **3.** | **a** | What do you understand from the term armature reaction? Describe the role of compensating windings in a DCgenerator? | **4M** | **2** | **3** |
| **b** | Briefly explain the function of compensating winding in DC machine. | **4M** | **2** | **3** |
| **4.** | **a** | Draw the load characteristics of DC compound motor and shunt motor. | **4M** | **3** | **3** |
| **b** | With a neat sketch, explain the procedure of Hopkinson’s Test? Mention its advantages and disadvantages. | **4M** | **3** | **3** |
| **5.** | **a** | Discuss the working principle of single-phase Transformer and also explain the constructional details. | **4M** | **4** | **3** |
| **b** | Define all day efficiency? Derive the expression. | **4M** | **4** | **3** |
| **6.** | **a** | Explain the working of single-phase auto transformer with neat diagrams? Derive an expression for saving of copper in it when compared to ordinary two winding transformer? | **4M** | **5** | **3** |
| **b** | What are the advantages of poly phase transformers? Give different configurations. | **4M** | **5** | **3** |
| **7.** | **a** | Differentiate between single excited and doubly excited Magnetic System. | **4M** | **1** | **3** |
| **b** | Distinguish between self-excited and separately exited DC Generators. Give the circuit diagrams of Self excited DC Generators and derive the voltage equations. | **4M** | **2** | **3** |
| **8.** | **a** | With the help of neat sketch, explain about swinburne’s test | **4M** | **3** | **3** |
| **b** | Draw the equivalent circuit of single phase transformer and explain | **4M** | **4** | **3** |
| **9.** | **a** | What is auto transformer? Explain the working principle of auto transformer | **4M** | **5** | **3** |
| **b** | How 4-point starter is different from 3-point starter. With a neat diagram explain the construction and working of 4-point stator | **4M** | **2** | **3** |

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