**Q.P. Code:** 18EE0204 **R18**

**Reg. No:** | | | | | | | | | | |

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**

(AUTONOMOUS)

**B.Tech II Year I Semester Supplementary Examinations November-2020**

**ELECTRICAL MACHINES-I**

(ELECTRICAL & ELECTRONICS ENGINEERING)

Time: 3 hours Max. Marks: 60

**PART-A**

(Answer all the Questions **5 x 2 = 10** Marks)

| | | | |
|---|---|---|---|
| **1** | **a** | What is the purpose of inter poles? | **2M** |
| | **b** | Write the working principle of a DC motor. | **2M** |
| | **c** | Write the condition for maximum efficiency. | **2M** |
| | **d** | Write the Emf equation of a transformer and define each term. | **2M** |
| | **e** | What are the limitations of Shaded Pole Induction Motor? | **2M** |

**PART-B**

(Answer all Five Units 5 x 10 = 50 Marks)

**UNIT-I**

| | | | |
|---|---|---|---|
| **2** | **a** | What are the causes for the failure of self-excitation? | **5M** |
| | **b** | Distinguish between Lap and Wave windings. | **5M** |

**OR**

| | | | |
|---|---|---|---|
| **3** | | Explain the effects of armature reaction in a DC Generator Briefly. | **10M** |

**UNIT-II**

| | | | |
|---|---|---|---|
| **4** | | A 25HP, 250V DC Series motor has armature resistance 0.1Ω and field resistance 0.05Ω and brush Contact drop 3V. When the line current is 80A, the speed is 600rpm. Find the speed when the line Current is 100A | **10M** |

**OR**

| | | | |
|---|---|---|---|
| **5** | | Explain the operation of four-point starter for a DC motor with neat diagram. | **10M** |

**UNIT-III**

| | | | |
|---|---|---|---|
| **6** | **a** | Enumerate the losses in DC machine. | **5M** |
| | **b** | Derive the condition for maximum efficiency. | **5M** |

**OR**

| | | | |
|---|---|---|---|
| **7** | | A Shunt generator delivers 195A at terminal Voltage of 250V. The armature resistance and shunt Field resistances are 0.02 Ω and 50 Ω respectively. The iron and friction losses equal 950W. Find (i) EMF generated (ii) Copper losses (iii) output of the prime mover (iv) commercial, mechanical and electrical efficiencies | **10M** |

## UNIT-IV

| | | | |
|---|---|---|---|
| **8** | **a** | Discuss the constructional features of transformers. Draw neat diagrams. | **6M** |
| | **b** | A 10KVA, 2200/400V transformer has R1=5 Ω, X1=12 Ω, R2=0.2 Ω and X2=0.48 Ω. Determine the equivalent impedance of the transformer referred to (i) primary side (ii) secondary side | **4M** |

**OR**

| | | | |
|---|---|---|---|
| **9** | **a** | Describe the Parallel operation of transformers with equal voltage ratios. | **5M** |
| | **b** | Draw the equivalent circuit of an Autotransformer. | **5M** |

## UNIT-V

| | | | |
|---|---|---|---|
| **10** | | Explain the construction and operation of Universal Motor. List out its merits and demerits. | **10M** |

**OR**

| | | | |
|---|---|---|---|
| **11** | | Discuss how you will perform O.C and S.C tests on a single phase transformer in the Laboratory. | **10M** |

***END***