**Q.P. Code:** 16EE212 **R16**

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

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

(AUTONOMOUS)

**B.Tech II Year II Semester Supplementary Examinations October-2020**

**ELECTRICAL TECHNOLOGY**

(Electronics & Communication Engineering)

Time: 3 hours Max. Marks: 60

(Answer all Five Units **5 x 12 = 60** Marks)

**UNIT-I**

| | | | |
|---|---|---|---|
| **1** | **a** | Derive the e.m.f. equation of the DC generator. | **6M** |
| | **b** | A 4 pole shunt generator with lap connected armature having field and armature resistances of 50Ω and 0.1Ω respectively, supplies 100V, 40 watts of 60 lamps. Calculate the total armature current, armature current per armature path and the generated emf. Allow a constant drop of 1V per brush. | **6M** |

**OR**

| | | | |
|---|---|---|---|
| **2** | **a** | Explain how voltage builds up in D.C shunt generator. | **6M** |
| | **b** | A 4 pole lap wound generator has 56 coils and 6 turns per coil. The speed is 1150 rpm. What must be the flux per pole in order to generate an induced emf of 265V? How many commutator bars are required for generator. | **6M** |

**UNIT-II**

| | | | |
|---|---|---|---|
| **3** | **a** | Deriving the necessary expressions, explain how to predetermine the efficiency of a d.c shunt motor. | **8M** |
| | **b** | Why a series motor cannot be started on no load? | **4M** |

**OR**

| | | | |
|---|---|---|---|
| **4** | **a** | State the necessity for a starter in DC motors and also draw the schematic diagram of 3-Point Starter. | **7M** |
| | **b** | List the different application of DC Motor. | **5M** |

**UNIT-III**

| | | | |
|---|---|---|---|
| **5** | | Draw and explain the constructional features of a single phase transformer. | **12M** |

**OR**

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|---|---|---|---|
| **6** | | The following readings were obtained from OC and SC tests on 2KVA, 115V / 230V, 50Hz transformer<br>OC test on LV side : 115V, 1.1A, 50W<br>SC test on HV side : 13V, 8.7A, 100W<br>(i) Draw the Equivalent circuit referred to primary.<br>(ii) Calculate the Regulation and efficiency at 3/4$^{th}$ full load and 0.8 Lag pf. | **12M** |

**UNIT-IV**

| | | | |
|---|---|---|---|
| **7** | **a** | Explain the torque slip characteristics of 3-phase induction motor. | **6M** |
| | **b** | A 50 Hz, 8 pole induction motor has a full load slip of 4%. The rotor resistance and reactance are 0.01Ω and 0.1Ω per phase respectively. Find the ratio of maximum to full load torque and speed at which the maximum torque occurs. | **6M** |

**OR**

| | | | |
|---|---|---|---|
| **8** | **a** | Derive torque equation of 3-phase induction motor under running condition. | **6M** |
| | **b** | A 4 pole 3-phase induction motor operated from a 50 Hz supply system. If the machine runs at 3% slip on full load. Calculate (i) The rotor speed (ii) The frequency of the rotor current and (iii) the frequency of the rotor current at standstill. | **6M** |

**UNIT-V**

| | | | |
|---|---|---|---|
| **9** | **a** | Explain the constructional features of 3-Ø alternators with the help of neat diagrams. | **6M** |
| | **b** | A 3 Ø 4-pole, 24 slot alternator has its armature coils short pitched by one slot. Find (i) 6M Pitch factor (ii) Distribution factor. | **6M** |

**OR**

| | | | |
|---|---|---|---|
| **10** | **a** | Explain the working principle of operation of a synchronous motor. | **6M** |
| | **b** | A 3-phase, 16 pole alternator has 144 slots with 4 conductors/slot, the winding being double layer winding. Flux in the air gap is 50 mwb sinusoidal distributed. The coil span is 1500 (electrical). Find the EMF generated when the alternator shaft is driven at 375 rpm. | **6M** |

*** END ***