

**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)  
**B.Tech II Year I Semester Regular & Supplementary Examinations December-2023**  
**ELECTRICAL MACHINES-I**  
(Electrical & Electronics Engineering)

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

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

**UNIT-I**

- |   |   |     |    |    |
|---|---|-----|----|----|
| 1 | a Explain the Types of DC Generators.   | CO1 | L2 | 6M |
|   | b Define armature reaction and Explain the demagnetizing effects of a DC Generator. | CO1 | L2 | 6M |

**OR**

- |   |   |     |    |    |
|---|---|-----|----|----|
| 2 | a Explain the uses of compensating winding. | CO1 | L3 | 6M |
|   | b Explain commutation with relevant sketch. | CO1 | L3 | 6M |

**UNIT-II**

- |   |   |     |    |    |
|---|---|-----|----|----|
| 3 | a Explain the remedial Measures for failure to self-excitation of DC generator. | CO2 | L3 | 6M |
|   | b What is the necessity of parallel operation of DC generators.                 | CO2 | L3 | 6M |

**OR**

- |   |  |     |    |    |
|---|--|-----|----|----|
| 4 | a Explain the procedure for parallel operation of DC generators. | CO2 | L3 | 6M |
|   | b Explain the uses of equalizer bar.                             | CO3 | L3 | 6M |

**UNIT-III**

- |   |   |     |    |    |
|---|---|-----|----|----|
| 5 | a What is the significance of Back E.M.F.                       | CO4 | L2 | 6M |
|   | b Derive the equation for the torque Developed by a D.C. motor. | CO4 | L3 | 6M |

**OR**

- |   |  |     |    |    |
|---|--|-----|----|----|
| 6 | a Explain the characteristic of DC shunt motor.  | CO4 | L3 | 6M |
|   | b A 25kW 250 V dc shunt generator has armature and field resistance of 0.06 ohm and 100 ohm respectively. Determine the total armature power developed when working (i) as a generator delivering 25kW output and (ii) as a motor taking 25kw input. | CO4 | L3 | 6M |

**UNIT-IV**

- |   |                                    |     |    |     |
|---|------------------------------------|-----|----|-----|
| 7 | Explain 4 point starter in detail. | CO5 | L3 | 12M |
|---|------------------------------------|-----|----|-----|

**OR**

- |   |   |     |    |    |
|---|---|-----|----|----|
| 8 | a What is the necessity of starter for DC machines. | CO5 | L1 | 6M |
|   | b What are the losses in DC machines.               | CO5 | L2 | 6M |

**UNIT-V**

- |   |   |     |    |    |
|---|---|-----|----|----|
| 9 | a Describe the advantage and disadvantages of permanent magnet stepper motor. | CO6 | L3 | 6M |
|   | b Compare VR stepper motor and SRM motor.                                     | CO6 | L2 | 6M |

**OR**

- |    |   |     |    |    |
|----|---|-----|----|----|
| 10 | a Explain the advantage and disadvantages of SRM.           | CO6 | L2 | 6M |
|    | b Describe permanent magnet stepper motor with neat sketch. | CO6 | L3 | 6M |

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