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**SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR**  
(AUTONOMOUS)**M.Tech I Year I Semester (R16) Regular Examinations January 2017****PRINCIPLES OF MACHINE MODELING AND ANALYSIS**

(Common to CS &amp; PE)

(For Students admitted in 2016 only)

Time: **3 hours**Max. Marks: **60**(Answer all Five Units **5 X 12 =60** Marks)**UNIT-I**

- Q.1** a. Write the basic two pole machine representation of commutator machines? 6M  
 b. What is Kron's primitive machine? Derive the voltage, current equations of Kron's Primitive machine? 6M

**OR**

- Q.2** a. Write the basic two pole machine representation of three phase synchronous Machine with Damper bars? 6M  
 b. Write the basic two pole machine representation of three phase Induction Machine? 6M

**UNIT-II**

- Q.3** a. Explain the generalized mathematical model of the separately excited DC motor. 6M  
 b. Derive the transfer function of separately excited DC motor 6M

**OR**

- Q.4** a. Explain the steady state and transient analysis of the separately excited DC Motor. 6M  
 b. Derive the transfer function of separately excited DC Motor. 6M

**UNIT-III**

- Q.5** a. Explain the transformation from rotating axes to stationary axes and vice versa in detail. 6M  
 b. Explain the physical concept of Park's transformation. 6M

**OR**

- Q.6** a. Explain the inductance matrix mathematical model of induction machine. 6M  
 b. Explain the d-q model of induction machine in Rotor reference Frame. 6M

**UNIT-IV**

- Q.7** a. Write steady state torque of single phase and poly -phase induction motor. 6M  
 b. Explain the steady state analysis of single-phase induction machine. 6M

**OR**

- Q.8** a. Explain the phase coordinate model of synchronous Machine. 6M  
 b. Write the Mathematical model of PM Synchronous motor. 6M

**UNIT-V**

- Q.9** a. Explain the PMDC drive motor schemes. 6M  
b. Derive the Average torque and Energy Conversion Ratio of Switched Reluctance Motor. 6M

**OR**

- Q.10** a. Explain the modelling of Permanent Magnet Brushless DC Motor? 6M  
b. Write the Mathematical model of switched reluctance Motor? 6M

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