GUJARAT TECHNOLOGICAL UNIVERSITY

ME - SEMESTER III (OLD) - • EXAMINATION - SUMMER 2016 Subject Code: 730704 Date:05/05/2016 **Subject Name: Advanced Electrical Drives** Time: 10:30 am to 01:00 pm **Total Marks: 70** Instructions: 1. Attempt all questions. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. (a) Draw the block diagram of sensorless vector control of PMSM. And explain the 0.1 07 important of PI Controller in this control scheme. Explain Direct Torque control of IM. Support your answer with necessary vector and 07 block diagrams. 0.2 Explain the Inverter Control strategy to run BLDC motor. Only prepare lookup table to 07 (a) run BLDC motor in clockwise and anticlockwise direction. Develop the mathematical model of Induction Motor in arbitrary reference frame. 07 **(b)** Describe difference between scalar and vector control method of electrical drive. 07 Draw the inductance profile of Switched Reluctance Motor. Explain the each step of 0.3 07 (a) this profile in detail. Show the control strategy for Stepper motor. Explain each block in detailed. 07 **(b)** Enlist the classification of PMSM motor and explain in view of construction of rotor. 07 **Q.3** (a) Write the advantages and disadvantages of rotor flux oriented and stator flux oriented **(b)** 07 vector control. Obtain the generalized model of 3 phase induction motor in arbitrary reference frame. 07 **Q.4** (a) Draw and explain the schematic diagram of a voltage flux estimator. **(b)** 07 OR Explain the different commutation techniques for permanent magnet motor. 07 **Q.4** (a) Derive the dynamic mathematical model of PMSM motor with proper assumptions. **07 (b)** Explain the model reference adaptive system for the speed estimation in speed control. **Q.5** (a) 07 Explain the control strategy for Hysteresis motor. **(b) 07** OR Explain the open loop flux control with indirect vector control with suitable block Q.5 07 (a) diagram. **(b)** Explain the control strategy for Linear Induction motor. 07
