## **GUJARAT TECHNOLOGICAL UNIVERSITY** ME – SEMESTER-1 (NEW) EXAMINATION – WINTER 2016

## Subject Code: 2710313 Date:06/01/2017 **Subject Name: Advance Industrial Drives & Control** Time: 2:30 pm to 5:00 pm **Total Marks: 70 Instructions:** 1. Attempt all questions. 2. Make suitable assumptions wherever necessary. 3. Figures to the right indicate full marks. Q.1 Enlist various Scalar Control methods used for speed control of Induction 07 **(a)** Motor. Discuss any one in brief. Discuss Multilevel converter-fed induction motor drive in brief. 07 **(b)** Explain operation of Cycloconverter-fed synchronous motor drive. 07 Q.2 **(a)** Discuss Self-controlled synchronous motor drive employing load commutated 07 **(b)** inverter with neat circuit diagram. OR **(b)** Describe operation of Vector control method for Synchronous motor. 07 Q.3 Explain the concept of Micro-stepping with necessary diagrams. 07 **(a)** Discuss construction & working of Brushless DC motor. 07 **(b)** OR 0.3 **(a)** With the use of neat diagram explain construction & working of Hybrid 07 stepper motor. Enlist various converters employed for speed control of Switch Reluctance **(b)** 07 Motor. Discuss any one in brief. 07 **Q.4** (a) Write a short note on: Model Reference Adaptive System. Enlist & explain performance parameters for selection of AC motor drive. **(b)** 07 OR Q.4 Discuss Direct Torque Control (DTC) method of Induction motor drive. 07 **(a)** Draw basic block diagram of Electric Drive System. Explain each block in **(b)** 07 detail. **Q.5** Explain operation of 1-phase controlled rectifier fed separately excited DC 07 **(a)** motor with necessary waveforms. Draw and explain speed -torque characteristics of DC Series & Shunt & 07 **(b)** PMDC motor. OR Discuss in brief: Position Control Method of DC Machine. 07 Q.5 **(a)** Write a technical note: Dynamic Model of DC Motor. 07 **(b)** \*\*\*\*\*