

**GUJARAT TECHNOLOGICAL UNIVERSITY****BE - SEMESTER-VII (OLD) - EXAMINATION – SUMMER 2018****Subject Code:172402****Date:01/05/2018****Subject Name:Industrial Drives and Control - II****Time:02:30 PM to 05:00 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** (a) Define Electric Motor Drive. Draw the detailed block diagram of AC Motor Drive and explain its advantages and disadvantages over DC Motor Drive. **07**
- (b) List the different types of Braking method of induction motor and explain any one in details with necessary diagram. **07**
- Q.2** (a) What is field oriented Control? List and define each type of it. Draw the Phasor diagram of the same and explain each nomenclature. **07**
- (b) Explain the operation of induction motor on unbalanced source voltage. **07**
- OR**
- (b) Discuss induction motor's behavior for non sinusoidal source voltage. **07**
- Q.3** (a) Explain operation of Closed loop control of static scherbius drive. **07**
- (b) Compare FCCSI and LCCSI in terms of motor type, power, Speed range, accuracy, maximum speed, performance, advantage, disadvantage and application.
- OR**
- Q.3** (a) Draw and explain block diagram of four quadrant closed loop speed control of 3- $\emptyset$  induction motor using 3- $\emptyset$  controller. **07**
- (b) Compare Kramer Drive and PWM VSI in terms of motor type, power, Speed range, accuracy, maximum speed, performance, advantage, disadvantage and application.
- Q.4** (a) Draw and explain indirect vector control block diagram with open loop flux control **07**
- (b) Explain the principle behind the variation of the speed of a 3- $\emptyset$  Induction Motor by V/F method. Discuss this for the following two modes : 1. Operation below rated frequency 2. Operation above rated frequency. **07**
- OR**
- Q.4** (a) Draw and explain speed torque curve with variable frequency control for the following two modes : 1. Operation at constant flux 2. Operation with V/F ration constant. **07**
- (b) Explain using a diagram, the working of a static scherbius system and also explain its advantages over static Kramer drive. **07**
- Q.5** (a) Explain principle of direct torque control scheme using necessary block diagram and switching logic. **07**
- (b) Draw and explain sensor less control of sinusoidal SPM drive based on terminal voltage and current. **07**
- OR**
- Q.5** (a) Draw and explain variable frequency PWM inverter drive with regeneration and minimum loss control. **07**
- (b) Draw and explain four phase SRM drive using waveform explaining commutation angle generation for one phase. **07**

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