

GUJARAT TECHNOLOGICAL UNIVERSITY

BE- SEMESTER-VII (NEW) EXAMINATION – WINTER 2020

Subject Code:2172402

Date:19/01/2021

Subject Name:Industrial Drives & Control-II

Time:10:30 AM TO 12:30 PM

Total Marks: 56

Instructions:

1. Attempt any FOUR questions out of EIGHT questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1**
- (a) List the difference between Active and Passive Load Torque. **03**
 - (b) Explain the four function of Power Electronics Modulator in Electric Motor Drive **04**
 - (c) Define Electric Motor Drive. Draw the detailed block diagram of AC Motor Drive and explain its advantages and disadvantages over DC Motor Drive. **07**
- Q.2**
- (a) List and describe in brief speed control methods for AC motor with block diagram. **03**
 - (b) Compare Scalar Control and Vector Control of Induction Motor drive with necessary diagram of graph. **04**
 - (c) Draw and Explain block diagram of single quadrant closed loop speed control of 3- Φ IM using 3- Φ Voltage controller. **07**
- Q.3**
- (a) Explain concept of Field Oriented Control. **03**
 - (b) Draw the Speed torque curve of an IM with Unbalanced Stator Voltage and Single Phasing diagram with necessary nomenclature: **04**
 - (c) Compare FCCSI and LCCSI in terms of motor type, power, Speed range, accuracy, maximum speed, performance, advantage, disadvantage and application. **07**
- Q.4**
- (a) Explain concept of Direct Torque Control. **03**
 - (b) Draw the Open Circuit and Closed Circuit Transition of Auto Transformer Starter diagram with necessary nomenclature. **04**
 - (c) Compare Kramer Drive and PWM VSI in terms of motor type, power, Speed range, accuracy, maximum speed, performance, advantage, disadvantage and application. **07**
- Q.5**
- (a) Discuss the dynamic modeling of Induction machines in brief giving necessary equations and figures. **03**
 - (b) List the braking method of Induction Motor and explain Plugging with necessary diagram. **04**
 - (c) Draw and explain indirect vector control block diagram with open loop flux control **07**
- Q.6**
- (a) State why is dynamic model required to derive over steady state model and the necessary assumptions made to derive the dynamic model. **03**
 - (b) List the braking method of Induction Motor and explain Regenerative braking with necessary diagram. **04**
 - (c) Explain the block diagram of direct vector control with rotor flux orientation. Draw necessary Phasor diagrams. **07**
- Q.7**
- (a) List different converters used for SRM drives and explain any one in brief. **03**
 - (b) List the starting method of Induction Motor and explain any one with necessary diagram. **04**
 - (c) Draw and explain four phase SRM drive using waveform explaining commutation angle generation for one phase. **07**

- Q.8**
- (a) Write Technical note on : Sinusoidal PMAC motor drive **03**
 - (b) List the starting method of Induction Motor and explain any one with necessary diagram. **04**
 - (c) Explain principle of direct torque control scheme using necessary block diagram and switching logic. **07**

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