

GUJARAT TECHNOLOGICAL UNIVERSITY

BE - SEMESTER-VI(NEW) – EXAMINATION – SUMMER 2019

Subject Code:2160913

Date:21/05/2019

Subject Name:Control of Electrical Drives

Time:10:30 AM TO 01:00 PM

Total Marks: 70

Instructions:

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

| | | MARKS |
|------------|---|-----------|
| Q.1 | (a) Enlist advantages of electrical drives. | 03 |
| | (b) Write a note on load torque and its classification. | 04 |
| | (c) Write a note on stability of an electrical drive. | 07 |
| Q.2 | (a) Explain speed control methods of DC series motor. | 03 |
| | (b) Explain dynamic model of DC motor drive. | 04 |
| | (c) Explain speed and position control scheme of dc motor using dynamic model of dc motor. | 07 |
| | OR | |
| | (c) Explain the 3- ϕ half wave converter drive for the speed control of separately excited dc motor with waveforms at $\alpha=30^\circ$, $\alpha=150^\circ$. | 07 |
| Q.3 | (a) Give dc 3points of comparison between converter fed dc drives and chopper fed drives. | 03 |
| | (b) Write a note on load equalization. | 04 |
| | (c) Explain closed loop speed control of induction motor using slip control scheme. | 07 |
| | OR | |
| Q.3 | (a) Draw the of circuit 1- ϕ dual converter drive for the speed control of separately excited dc motor. Also draw the waveform. | 03 |
| | (b) Explain stator voltage control of induction motor. | 04 |
| | (c) Explain closed loop speed control of induction motor using current limit control scheme. | 07 |
| Q.4 | (a) Explain the effect of non sinusoidal supply on VSI. | 03 |
| | (b) Give four points of comparison between scalar control and vector control of induction motor | 04 |
| | (c) Explain flux oriented vector control of induction motor. | 07 |
| | OR | |
| Q.4 | (a) Enlist advantages of V/f control of induction motor. | 03 |
| | (b) Draw block diagram of vector control of induction motor. | 04 |
| | (c) Explain d-q model of induction motor. | 07 |
| Q.5 | (a) What are the functions of power modulator? | 03 |
| | (b) State advantages and disadvantages of electric traction drives. | 04 |
| | (c) Explain general information about BLDC speed drives. | 07 |
| | OR | |
| Q.5 | (a) Enlist factors to be considered for selection of electrical drive. | 03 |
| | (b) Draw block diagram of solar powered drives and mention functions of each block. | 04 |
| | (c) Explain general information about synchronous motor variable speed drives. | 07 |
