Enrolment No.

GUJARAT TECHNOLOGICAL UNIVERSITY BE - SEMESTER-VI • EXAMINATION – WINTER • 2014

Subject Code: 162404

Subject Name: Industrial Drives and Control-I

Date: 05-12-2014

Time: 02:30 pm - 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) Discuss in brief, Phase Locked Loop (PLL) control of the dc motor drive using 07 block diagram.
 - (b) Explain phase controlled 6-pulse converter in discontinuous conduction mode 07 for separately exited DC motor with $\alpha = 60^{\circ}$.
- Q.2 (a) Discuss closed loop speed control of DC motor. Why current loop is to be 07 introduced as an inner loop in closed loop operation.
 - (b) With the use of neat diagram discuss Ward Leonard Control of DC Machine. 07 OR
 - (b) Enlist various requirements for DC drive & Explain concept of DC drive with 07 block diagram.
- Q.3 (a) Derive the fundamental torque equation indicating dynamics of electric drives. 07
 - (b) Write a short note on 1 Phase half controlled drive with series excited DC 07 motor in continuous conduction mode.

OR

- Q.3 (a) With the use of typical application explain four quadrant operation of DC 07 machine in detail.
 - (b) Discuss operation of 1 Phase semi controlled drive with discontinuous 07 conduction mode with freewheeling diode for separately excited DC Machine.
- Q.4 (a) Explain regenerative operation of DC DC converter fed DC Machine with 07 necessary diagrams.
 - (b) Compare circulating & non-circulating current mode for 1 Phase Dual 07 converter.

OR

- Q.4 (a) Discuss four quadrant operation of DC DC converter for separately excited 07 DC Machine.
 - (b) Explain inversion mode operation of 1-Phase controlled rectifier with DC Motor 07 as a load.
- Q.5 (a) Enlist various requirements for implementation of servo motor drive. 07
 - (b) With the use of block diagram explain closed operation of armature control 07 using flux weakening mode.

OR

- Q.5 (a) Write a short note on permanent magnet drive. 07
 - (b) Compare P, PI & PID controller & give application of each. 07
