Total No. of Questions : 5] *[Total No. of Printed Pages : 2*

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EX/EE-7002 (CBGS)

B.E. VII Semester

Examination, November 2018

Choice Based Grading System (CBGS)

Electric Drives

Time : Three Hours

Maximum Marks : 70

Note: i) Solve any two from each questions.

ii) All questions carry equal marks.

1. a) What are the problems on converter fed d.c. motor? Give N-T characteristics of d.c. motors. 7

   b) Draw the block diagram and state modes of operation of electric drive. 7

   c) Describe single phase semi and fully controlled converters and three semi and fully controlled converters connected to d.c motors. 7

2. a) Explain four quadrant operation of motor driving a hoist load. https://www.rgpvonline.com 7

   b) What are different components of load torque? Describe control of D.C. motors by choppers. 7

   c) Calculate starting time of a drive with the following parameters: 7

   $T = 10$ kg-m^2, $T = 15+0.5\ \omega_m$ and $T_L = 5+0.6\ \omega_m$.

3. a) What are different energy conservation methods for electric drive? Describe N-T characteristics of induction motors. https://www.rgpvonline.com 7

   b) Describe PWM control comparison of VSI and CSI operation. 7

   c) A star connected cage induction motor has 50 Hz, 4 pole, 1370 rpm, 400 V parameters:

   $R_s = 2\Omega$, $R_r = 3\Omega$, $X_s = X_r = 3.5\Omega$, $X_m = 55\Omega$ controlled by CSI at a constant flux. Calculate motor torque, speed at 30 Hz and rated slip speed. 7

4. a) Describe static Scherbius drive with help of neat diagram. 7

   b) Explain Static Kramer Drive with performance. 7

   c) Explain variable frequency control of induction motor by voltage source. 7

5. a) Describe 25 kV traction using semiconductor converter controlled polyphase A.C. motor. 7

   b) Describe construction and operation of an electric arc furnace. https://www.rgpvonline.com 7

   c) What are different methods of starting of an induction motor with its control on stator side. 7

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