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BIEEE-016

B.Tech. – VIEP – ELECTRICAL ENGINEERING (BTELVI)

Term-End Examination

December, 2015

BIEEE-016 : INDUSTRIAL DRIVES

Time : 3 hours *Maximum Marks : 70*

Note : *(i) Attempt any **seven** questions.*

(ii) All questions carry equal marks.

(iii) Missing data, if any, may be suitably assumed.

(iv) Use of scientific calculator is permitted.

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1. What is electric drive system ? Draw its block diagram and explain its working. *10*

2. (a) What are the advantages of a.c. drives over d.c. drives ? *5*

(b) Explain the various techniques used to control the electric drives. *5*

3. (a) Draw the speed-torque characteristic of d.c. series motor and also write its expression. *5*

(b) What is chopper fed d.c. drive ? Explain with the help of a schematic diagram and waveforms. *5*

4. A 220 V, d.c. shunt motor takes 50 A, when giving its rated output at 1500 rpm. Its total resistance is 0·25 Ω. Determine the resistance to be added in series with the motor to obtain the rated torque at (a) starting, (b) 1000 rpm. *10*

5. A 230 V d.c. series motor used in lifts has a resistance of 0·25 Ω. It draws 40 A at a speed of 1500 rpm. Assume that the magnetization curve is a straight line between zero and 40 A, and the flux per pole at 60 A is 20% greater than at 40 A. Determine the resistance to be added in series with the motor for a speed of 3000 rpm at the current of 15 A. *10*

6. Explain the working of Current Source Inverter (CSI) controlled 3-phase induction motor drive in the schematic, waveform and expressions. *10*

7. (a) Explain the slip power recovery scheme in a.c. motor drive system. *5*

   (b) Draw the speed-torque characteristic of 3-phase induction motor and explain its usefulness in drive application. *5*

8. What is cycloconverter ? Explain its application in synchronous motor drive with schematic, waveform and expressions. *10*

9. What is brushless d.c. motor ? How is its speed controlled with various methods ? *10*

10. Write short notes on any ***two*** of the following : *2×5=10*

(a) Solar and battery powered drives

(b) Four quadrant operation of d.c. drive

(c) Variable frequency control of synchronous motor