BIEE-020

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

Term-End Examination

00633

December, 2016

BIEE-020 : ELECTRICAL MACHINES AND ELECTRONICS

Time : 3 hours   *Maximum Marks : 70*

Note : Attempt any seven questions. All questions carry equal marks. Use of scientific calculator is permitted.

1. Explain how power can be measured by two-wattmeter method for a three-phase balanced load.   *10*

2. Draw and explain the phasor diagram of a 1-φ transformer on the following :   *5+5=10*

    (a)   Unity power factor load

    (b)   Lagging power factor load

3. The full load voltage drops in a single-phase transformer are 2% and 4% due to resistance and leakage reactance respectively. The full load ohmic loss is equal to the iron loss. Calculate

    (a)   the efficiency on full load at unit p.f.,

    (b)   the load p.f. at which the voltage drop is zero.   *5+5=10*

4. A 4-pole, 50 Hz, 3-φ induction motor develops a maximum torque of 110 Nm at 1360 r.p.m. The resistance of the star-connected rotor is 0·25 Ω/phase. Calculate the value of resistance that must be inserted in series, with each rotor phase, to produce a starting torque equal to half the maximum torque. *10*

5. What are the different types of single-phase induction motors ? Explain any one of them in detail. *10*

6. Describe steady and dynamic characteristics of electric drives. *10*

7. What are the different types of load ? Explain in detail and also explain the importance of load equalization. *4+4+2=10*

8. Describe the working principle of step-up chopper and also explain how it is different from step-down chopper. *6+4=10*

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

  (a) Welding Transformers

  (b) Torque – Slip Characteristics of Three-phase Induction Motors

  (c) Routine Test of Transformers