

**B.Tech. - VIEP - ELECTRICAL ENGINEERING
(BTELVI)**

Term-End Examination

June, 2015

00026

**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. Derive the expression for active and reactive power when the power polyphase circuit is measured for balanced load by two wattmeter method. Draw connection and phasor diagrams also. 6+2+2=10

2. Three inductive loads of 50 mH are connected in star to a 3-phase, 200 V, 50 Hz system. Calculate the inductance of each load, which when connected in delta to the same supply will take the same line current. 10

3. Draw the phasor diagram of a single phase transformer when the
 - (a) inductive load is connected,
 - (b) pure resistive load is connected. 5+5=10

4. Derive an equivalent circuit of a transformer referred to primary. Also draw the approximate equivalent circuit referred to secondary. 7+3=10

5. Draw slip – torque characteristics of a 3-phase induction motor and explain why the maximum torque is independent of rotor resistance but exact location is dependent on it. Derive the condition for maximum torque. 4+2+4=10

6. Explain the various factors which are to be considered while selecting a motor. What are the different types of loads ? 7+3=10

7. (a) With the help of a neat circuit diagram explain the working of an SCR. 5
- (b) Explain the different methods to turn on a thyristor. 5

8. Explain the working of a step down chopper. Give its advantages and limitations. 10

9. A 6-pole, 3-phase, 50 Hz induction motor develops a maximum torque of 30 N-m at 960 rpm. Determine the torque exerted by the motor at 5% slip. The rotor resistance per phase is 0.6 Ω. 10

10. Write short notes on any *two* of the following : 2×5=10
 - (a) Starting methods of single-phase induction motor
 - (b) Short circuit test of a transformer
 - (c) Load equalization