

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

Term-End Examination

00323

June, 2018

**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. What are the methods to measure power in a three-phase circuit ? Explain with the help of neat connection diagrams. 10

2. A three-phase 5 kW induction motor has a power factor of 0.7 (lagging) at full load. What should be done to improve the power factor to 0.85 (lagging) ? 10

3. Draw the vector diagram of a power transformer under full-load condition. Also differentiate between power transformer and distribution transformer. 10
4. The maximum efficiency of a single-phase 250 kVA, 2000/250 V transformer occurs at 80% of full load and is equal to 97.5% at 0.8 p.f. Determine the efficiency and regulation on full load at 0.8 p.f. lagging if the impedance of the transformer is 9%. 10
5. Explain the principle of operation of a three-phase induction motor. Also state the effects of increasing rotor resistance on starting current, starting torque, maximum torque and full-load slip of an induction motor. 10
6. The name plate of a single-phase, 4-pole induction motor gives the following data :
Output = 410 W; Supply voltage = 230 V;
Frequency = 50 Hz; Input current = 3.2 A; Power factor = 0.7 (lagging); Speed = 1410 rpm.
Calculate : 10
- (a) The efficiency of the motor, and
- (b) The slip of the motor when delivering the rated output.

7. What is meant by 'load equalization' ? How is it accomplished ? Explain. 10

8. Differentiate between 'latching current' and 'holding current' of a thyristor. Also explain the circuit schematic using power electronic devices for variable voltage speed control of a squirrel-cage induction motor. 10

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

(a) Welding Transformer

(b) Testing of Single-Phase Induction Motor

(c) Selection of Motors for Industrial Use
