No. of Printed Pages : 3

BIEE-020

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

00022

Term-End Examination

December, 2017

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. Deduce the relationship between the phase and line voltages and currents of a three-phase star-connected system. Also draw the phasor diagram. *10*

2. Each phase of a three-phase, Δ-connected load consists of an impedance $Z = 20 \angle 60° \Omega$. The line voltage is 440 V at 50 Hz. Compute the power consumed by each phase impedance and the total power. What will be the readings of the two wattmeters connected ? *10*

3. Describe the procedure of conducting open circuit and short circuit tests on a single phase transformer. Derive the expressions of equivalent circuit parameters of core and windings. *10*

4. What are the different types of losses in a transformer ? Define efficiency of a transformer and derive the expression for condition of maximum efficiency. *10*

5. With the help of proper phasor diagrams, prove that a 3-phase AC source connected to an induction motor produces a rotating magnetic field in the air gap. *10*

6. A 150 kW, 3000 V, 50 Hz, 6-pole star-connected induction motor has a star-connected slip ring rotor with a transformation ratio of 3·6. The rotor resistance is 0·1 Ω/phase and leakage inductance is 3·61 mH/phase. Find the starting current and starting torque on rated voltage with short circuited slip rings. *10*

7. What are the advantages of electrical drives ? What are the main factors that decide the choice of electric motor for a drive application ? *10*

8. What are the different methods of turning on a thyristor ? Explain any one in detail. *10*

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

(a) Measurement of Reactive Volt-Amperes

(b) Welding Transformer

(c) Dynamic Characteristics of Electric Drives

(d) Operation of a Chopper