

GUJARAT TECHNOLOGICAL UNIVERSITY**BE - SEMESTER-V • EXAMINATION – SUMMER • 2014****Subject Code: 152001****Date: 11-06-2014****Subject Name: Electro Mechanical Energy Conversion****Time: 10.30 am - 01.00 pm****Total Marks: 70****Instructions:**

1. Attempt all questions.
2. Make suitable assumptions wherever necessary.
3. Figures to the right indicate full marks.

- Q.1** (a) List out and explain the properties of a magnetic material. **07**
(b) Write a short note on types of Magnetic materials. **07**

- Q.2** (a) State and explain Ampere's and Biot-Savart's law. **07**
(b) For an attracted armature relay excited by an electric source, explain mechanical energy. **07**

OR

- (b) Explain AC operation of magnetic circuits. **07**
- Q.3** (a) Derive the expression for power loss in ferromagnetic structure due to eddy current effects. **07**
(b) Derive the expression for magnetic field due to current in straight wire. **07**

OR

- Q.3** (a) Explain energy balance in non-linear magnetic systems excited by a single source with suitable graphs and expressions. **07**
(b) Explain energy stored in capacitor and energy density in electric field with suitable expressions. **07**

- Q.4** (a) Why single phase induction motor is not self starting? Also Explain methods of starting single phase Induction motor. **07**
(b) Explain construction of an induction motor. **07**

OR

- Q.4** (a) Explain construction & working of an elementary generator. **07**
(b) Explain generalized machine and also give energy conversion in matrices equations. **07**

- Q.5** (a) Derive the expression for emf generated in practical DC machines. **07**
(b) Explain rotating magnetic field in 2-phase and 3-phase induction machine. **07**

OR

- Q.5** (a) Explain reluctance motor. **07**
(b) Explain hysteresis motor. **07**
