

GUJARAT TECHNOLOGICAL UNIVERSITY
BE - SEMESTER-V EXAMINATION – WINTER 2015

Subject Code: 152001**Date:15/12/2015****Subject Name: Electro Mechanical Energy Conversions****Time: 10:30am to 1:00pm****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 different principles which are involved in electromechanical energy conversion. Explain any one in details. **07**

(b) Draw and explain hysteresis loop in detail. **07**

Q.2 (a) Explain generated and induced emfs. **07**

(b) Explain magnetic field distribution in a long solenoid while the solenoid coil is carrying dc current. Also derive the equation of magnetic field for the solenoid. **07**

OR

(b) Explain polarization of dielectric materials. **07**

Q.3 (a) How rotating magnetic field is produced in different rotary electromechanical energy converter devices? Explain in details. **07**

(b) Explain eddy currents and eddy current losses. How these losses can be minimized? **07**

OR

Q.3 (a) What is fringing and leakage flux? What are the effects of fringing and leakage flux on calculations of various parameters of magnetic circuits? **07**

(b) Explain various power stages of mechanical to electrical energy conversion. **07**

Q.4 (a) Explain energy conversion in DC motors. **07**

(b) Why flux splitting is needed in some of the electromechanical energy converter devices? List various methods of flux splitting and explain any one of them. **07**

OR

Q.4 (a) Explain energy conversion in three phase induction motors. **07**

(b) Draw and explain magnetization characteristics of DC generator. **07**

Q.5 (a) Explain reluctance motors in details. **07**

(b) What is rotating magnetic field? How it is created in single phase induction motors? **07**

OR

Q.5 (a) Explain single phase single value capacitor start and run induction motor. **07**

(b) Explain construction of synchronous AC machines. **07**
