

- (b) A 6 pole wave wound DC generator has 720 conductors. A flux of 80 mWb/pole is driven at 1000 rpm. Find the generated emf. **10**
7. (a) What is the function of magnetic core in electrical machines ? **8**
- (b) What do you understand by eddy current and hysteresis losses ? To what extent are these losses affected by changes in thickness of core plates. **12**
8. Write short notes on any *two* of the following :
(a) Magnetic circuits and its applications **10**
(b) Autotransformer **10**
(c) Principle of electromechanical energy conversion. **10**

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Roll No.

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B. Tech. EXAMINATION, Dec. 2017

(Third Semester)

(Old Scheme) (Re-appear Only)

(ECE, IC, AEI)

EE-205

**ELECTROMECHANICAL ENERGY
CONVERSION**

Time : 3 Hours]

[Maximum Marks : 100

Before answering the question-paper candidates should ensure that they have been supplied to correct and complete question-paper. No complaint, in this regard, will be entertained after the examination.

Note : Attempt any *Five* questions. All questions carry equal marks.

1. (a) Derive the expression of emf of a DC generator. What are the requisite conditions for building up of voltage in a self excited DC generator ? **10**
- (b) A 10 kVA single phase transformer has 200 turns in winding and 100 turns in the other winding. The frequency of supply is 50 Hz. If the induced emf in the primary side is 250V, find the value of maximum flux density if the core area is $64 \times 10^{-4} \text{ m}^2$. **10**
2. (a) Explain construction working principle of transformer, and derive its emf equation. **10**
- (b) A 4 pole 50Hz, three phase induction motor when loaded has total rotor input of 3000 W. Determine the torque developed in N-m and synchronous watts. What is synchronous condenser ? Explain with the help of phasor diagram. **10**
3. (a) Derive an expression for the induced emf of a synchronous generator. **10**
- (b) Why synchronous motors are not self starting ? Explain. **10**
4. (a) Explain, why single phase induction motor is not self starting with the help of cross-field theory ? **10**
- (b) How the speed is controlled by adding an external resistance in the rotor circuits ? **10**
5. (a) Explain, how rotating magnetic field is produced in three phase induction motor ? **10**
- (b) Explain the effect of change in the rotor resistance on the torque-slip characteristics. **10**
6. (a) Describe the working principle of DC series motor, and draw its various characteristics. **10**