**8470**

### BT-3/D06
### Electromechanical Energy Conversion
### PAPER - ELE-201E, Option - (1)

Time : 3 Hrs.                                    Maximum Marks : 100

Note : Attempt any five questions.

1. a. State Faraday's laws of electro-magnetic induction and explain how it is applied for working of a d.c. motor. 10

   b. Discuss the various types of Losses of magnetic circuits.
      10

2. a. Draw the no-load phasor diagram of a transformer and derive expression for magnetizing and core-loss components of no-load current.        10

   b. Define the voltage regulation of a transformer. Deduce the expression for the voltage regulation.        10

3. a. What is an electromechanical conversion device ? Explain the working of a generator with the help of a power flow diagram.        10

   b. Explain how torque is produced in a rotating electrical machine. What do you understand by torque angle ?10

4. a. Derive the expression for generated emf in a d.c. generator. Define all the symbols with their units.    10

   b. Discuss the effects of armature reaction in a d.c. genrator.        10

5. a. What is meant by back emf ? If the back emf greater or lesser than the applied voltage ? Why ? By what amount

do the two voltage differ ?

   b. Discuss the flux central method for the speed of a shunt motor.        10

6. Discuss the point of similarities between a transformer and an induction motor. Hence, explain why an induction machine is called a generalized transformer ? Why an induction motor, at no-load, operates at a very low powe factor ?        20

7. a. Draw the torque-speed characteristics of polyphase induction motor and clearly indicate the effect of change in rotor resistance.        10

   b. Explain the terms slip, slip frquency, wound rotor and cage rotor.        10

8. Write short notes on the following :

   a. Starting on synchronous motor        10

   b. V-curves of synchoronous motor        10