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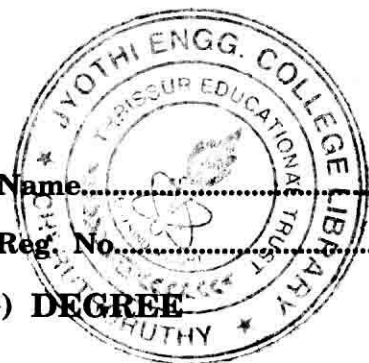
THIRD SEMESTER B.TECH. (ENGINEERING) DEGREE EXAMINATION, NOVEMBER 2013

EC 09 306/PT EC 09 305—ELECTRICAL ENGINEERING

Time : Three Hours

Maximum : 70 Marks

Part A

*Answer **all** questions.*

1. What is meant by commutation process in DC machine ?

2. Define armature reaction.

3. Mention disadvantages of autotransformer.

4. Why is synchronous motor not self starting ?

5. What is slip of an induction motor ?

(5 × 2 = 10 marks)

Part B

*Answer any **four** questions.*

1. A short shunt compound generator delivers a load current of 30 A at 200 V and has armature, series and shunt field resistances of 0.05 Ω, 0.03 Ω and 200 Ω respectively. Calculate induced e.m.f and armature current. Allow 1.0 V per brush for contact drop.

2. Explain how autotransformer is different from two winding transformer.

3. Define speed regulation and percentage speed regulation of a d.c. motor.

4. Derive e.m.f. equation of an alternator.

5. List out the applications of a synchronous motor.

6. Explain torque-slip characteristics of a 3-phase induction motor.

(4 × 5 = 20 marks)

Part C

*Answer **one** question from each Module.*

MODULE I

1. Discuss external characteristics of D.C. generators.

Or

2. Explain principle of operation of a D.C. motor. Derive an expression for torque developed by the motor.

Turn over

MODULE II

3. Discuss in detail about open circuit test and short circuit test on transformers.

Or

4. Explain in detail about the principle of operation of an induction type energy meter.

MODULE III

5. Explain with neat sketches, the principle of operation of a synchronous motor. Explain why 3-phase synchronous motor develops torque only at synchronous speed.

Or

6. Define voltage regulation. How can voltage regulation be predetermined by E.M.F. method is an alternator ?

MODULE IV

7. Why do we need starters in three-phase induction motors ? Explain operation of rotor resistance starter.

Or

8. Explain torque-slip characteristics of a three-phase induction motor.

(4 × 10 = 40 marks)