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Name.........................

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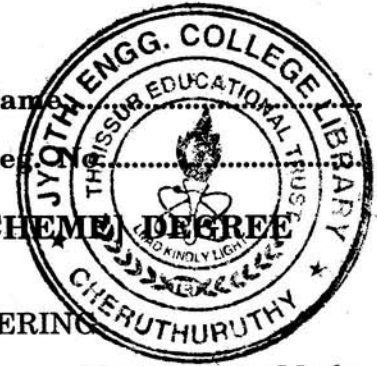
THIRD SEMESTER B.TECH. (ENGINEERING) [09 SCHEME] DEGREE EXAMINATION, NOVEMBER 2014

EC 09 306/PTEC 09 305—ELECTRICAL ENGINEERING

Time : Three Hours

Maximum : 70 Marks

Part A

Answer **all** *questions.*
Each question carries 2 marks.

1. Why does a transformer have an iron core ?

2. What are effects of armature reaction on flux distribution in a d.c. machine ?

3. List out the applications of D.C. shunt motors.

4. Define distribution factor.

5. How will you improve the starting torque of a 3-phase induction motor ?

(5 × 2 = 10 marks)

Part B

Answer any **four** *questions.*
Each question carries 5 marks.

1. A 8-pole d.c. generator has 500 armature conductors and a useful flux of 0.05 Wb. What will be the e.m.f. generated, if it is lap connected and runs at 1200 r.p.m. ? What must be the speed at which it is to be drives to produce same e.m.f., if it is wave wounded ?

2. Write short notes on transformer losses.

3. Distinguish between cross magnetization and demagnetization effects of armature reaction.

4. Discuss effect of armature reaction on terminal voltage of a synchronous generator at various power factor loads.

5. Draw equivalent circuit diagram of a three-phase induction motor.

6. Discuss blocked rotor test for an induction motor.

(4 × 5 = 20 marks)

Part C

Answer **one** *question from each module.*
Each question carries 10 marks.

Module I

1. Explain characteristics of series wound D.C. generators.

Or

Turn over

2. Explain the principle of operation of a D.C. motor. Derive an expression for back e.m.f. in a D.C. motor.

Module II

3. Explain the working principle of a moving iron instrument.

Or

4. Explain construction and working of an autotransformer.

Module III

5. A 2000 V, 3-phase star connected synchronous motor has an effective resistance and synchronous reactance of 0.2 Ω and 2.2 Ω respectively. The input is 800 kW at a normal voltage and the generated lime e.m.f. is 2500 V. Calculate line current and power factor.

Or

6. Explain construction features of a salient pole alternator.

Module IV

7. Draw and explain equivalent circuit of a three-phase induction motor.

Or

8. (a) Explain power flow diagram of a three-phase induction motor.   (5 marks)

   (b) Derive condition for maximum torque of a three-phase induction motor under running condition.

(5 marks)

[4 × 10 = 40 marks]