Code: 15A02306 **R15**

B.Tech II Year I Semester (R15) Regular & Supplementary Examinations November/December 2017

ELECTRICAL TECHNOLOGY

(Common to ECE & EIE)

Time: 3 hours Max. Marks: 70

PART – A

(Compulsory Question)

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1 Answer the following: (10 X 02 = 20 Marks)

(a) Define critical field resistance of a DC shunt generator.
(b) What is the function of interpoles in DC machines?
(c) Write the torque equation of a DC motor.
(d) Classify the different types of speed control methods in DC motors.
(e) Draw the equivalent circuit of a single phase transformer.
(f) Write the e.m.f. equation of a single phase transformer.
(g) Explain why speed of an induction motor cannot be equal to the synchronous speed.
(h) List out the applications of 3-phase induction motor.
(i) Define voltage regulation of an alternator.
(j) Write the advantages of synchronous machine compared to other AC machines.

PART – B

(Answer all five units, 5 X 10 = 50 Marks)

UNIT – I

2 Describe the process of voltage build up in self-excited generators in detail.

OR

3 Explain with neat diagram the function of commutator and stator in a DC generator.

UNIT – II

4 Draw and explain the nature of speed – torque and torque – current characteristics of:

(a) Shunt motors.
(b) Series motors

OR

5 What are the different losses in a DC machine? Which of them are variable losses? Derive the condition for maximum efficiency of a DC machine.

UNIT – III

6 Define voltage regulation of a transformer. Derive an expression for voltage regulation under lagging p.f. load.

OR

7 Describe briefly the various losses in a transformer in detail.

UNIT – IV

8 What are the advantages and disadvantages of a Squirrel – Cage motor over a Wound – rotor motor?

OR

9 Draw and explain the torque-slip characteristics of a 3-phase induction motor.

UNIT – V

10 Explain the differences between cylindrical rotor and salient pole rotor used in large synchronous machines.

OR

11 (a) Derive e.m.f. equation for an alternator.
(b) Explain the principle of operation of synchronous motor.

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