D 90009 (Pages : 2) Name.....

Reg. No.....

THIRD SEMESTER B.TECH. (ENGINEERING) [14 SCHEME] DEGREE EXAMINATION, NOVEMBER 2015

ME 14 305/MT 14 305—ELECTRICAL TECHNOLOGY

Time : Three Hours Maximum : 100 Marks

Part A

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

1. Draw the equivalent circuit of transformer referring to primary side with neat a phasor diagram.
2. Justify how an electrodynamometer instrument can work with both AC and DC sources. Explain with torque equation.
3. Compare Power MOSFET, SCR, IGBT under various parameters.
4. Explain various parts of Electric Drive system. List the classifications of drive systems under different parameters.
5. Explain the speed control methods of DC motors.
6. Explain the process of armature reaction in DC shunt generator.
7. Explain the torque-slip characteristics of an Induction machine.
8. Draw and explain the construction of three-phase Induction motor.
9. Draw the Mechanical and Electrical characteristics of DC Shunt and Series motor.
10. What is the need for starter? Explain briefly about three point starter ?

(8 × 5 = 40 marks)

Part B

Answer **all** *questions.*
Each question carries **15** *marks.*

11. (a) Define transformer. List the types of transformer based on voltage level and construction. Explain the working of transformer with constructional diagram and derive the torque equation.

Or

(b) Explain the construction and working of an instrument that operates only with DC source and derive the torque equation for the same and justify why it cannot be used with AC source.

Turn over

12. (a) Explain the working of SCR with diagram. Briefly explain the Turn-On and Turn-Off methods of a Thyristor. Draw the following characteristics of Thyristor :

(i) VI characteristics.

(ii) Turn-On characteristics.

(iii) Turn-Off characteristics.

Or

(b) Explain the operation of single-phase fully controlled converter with R-Load representing waveforms for the following: supply voltage, supply current, load voltage, load current and voltage across thyristors. Also derive the average voltage expression.

13. (a) Explain with neat diagram the construction and working of an alternator. Derive the EMF equation of alternator.

Or

(b) Explain with neat diagram the construction and working of a DC motor. List the types and explain them briefly. Also Derive the torque equation.

14. (a) Explain four starting methods of Three-phase Induction machine.

Or

(b) Develop the Equivalent circuit for a Three-phase Induction motor.

(4 × 15 = 60 marks)