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Name.....

Reg. No.....

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

AI 09 304—ELECTRICAL ENGINEERING

Time : Three Hours Maximum : 70 Marks

Part A

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

1. What is meant by armature reaction ?
2. Calculate the reactance voltage for a machine having the following particulars. Number of commutator segments = 55, revolutions per minute = 900, brush width in commutator segments = 1.74, co-efficient of self reaction = 153×10^{-6} Henry. Current per coil = 27A.
3. Differentiate Lagging and leading power factor on transformers.
4. What are secondary instruments ?
5. List the effects used in measuring instruments.

(5 × 2 = 10 marks)

Part B

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

6. A short shunt compound generator delivers a load current of 30 A at 220 V and has armature, series-field and shunt-field resistances of 0.05 Ω, 0.30 Ω and 200 Ω respectively. Calculate the induced e.m.f. and armature current. Allow 10 V per brush for contact drop.
7. The full-load copper loss on the HV side of a 100 kVA, 11000/317 V, 1-phase transformer is 0.62 kW and on the LV side is 0.48 kW. (i) Calculate R1, R2, R3 in ohms. (ii) Total reactance is 4 percent find X1, X2 and X3 in ohms, if the reactance is divided in the same proportion as resistance.
8. Describe the types of rotors used in alternators.
9. Describe the relation between torque and rotor power factor in induction motor.
10. Explain the gravity control of producing controlling torque.
11. Explain the working of Wheatstone bridge.

(4 × 5 = 20 marks)

Turn over

Part C

Answer section (a) **or** *section (b) of each question.*
Each question carries 10 *marks.*

12. (a) Discuss about the starting and speed control of series motor.

Or

(b) Explain shunt motor starter.

13. (a) Describe three-phase transformer connection.

Or

(b) Explain in detail the conversion of 3-phase to 2-phase and vice versa of transformers.

14. (a) Explain the methods of measuring slip of an induction motor.

Or

(b) Describe the equivalent circuit of induction motor.

15. (a) Describe the working of moving coil and state why it is suitable for DC only.

Or

(b) Explain the working of dynamometer type ammeter and voltmeter using a neat diagram.

(4 × 10 = 40 marks)