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**Question Paper Code: 31045**

B.E. / B.Tech. DEGREE EXAMINATION, APRIL 2015.

Third Semester

Electronics and Communication Engineering

01UEE323 - ELECTRICAL MACHINES

(Common to Instrumentation and Control Engineering and Mechanical Engineering)

(Regulation 2013)

Duration: Three hours

Maximum: 100 Marks

Answer ALL Questions.

PART A - (10 x 2 = 20 Marks)

1. Define armature reaction.
2. State any two applications of D.C Shunt and Series motors.
3. What is the function of breather in transformer?
4. Why the efficiency of transformer is more than that of other rotating machines?
5. Why rotor of squirrel cage induction motor is skewed?
6. How the frequency of rotor emf is related to the slip in an induction motor?
7. What is pessimistic method in an alternator?
8. What is synchronous condenser?
9. Name the starting methods for single phase induction motor.
10. Define holding torque.

PART - B (5 x 16 = 80 Marks)

11. (a) (i) Derive the EMF equation of a D.C. Generator. (8)  
(ii) Draw and explain about the separately excited and self excited D.C. generator and also write the relevant current and voltage equations. (8)

Or

- (b) Discuss about the various performance characteristics of DC shunt and series motor. (16)
12. (a) Derive and explain the equivalent circuit of a transformer with neat sketch. (16)

Or

- (b) Explain the various connections of three phase transformers with relevant diagrams. (16)
13. (a) (i) Describe the principle of operation of a 3 phase induction motor. (8)  
(ii) Derive the torque equation for a three phase induction motor. (8)

Or

- (b) Explain about the working of autotransformer and star-delta starter used in 3 phase induction motor. (16)
14. (a) (i) Explain clearly the MMF method of determining the regulation of an alternator. (8)  
(ii) State and explain the conditions for parallel operation and synchronism of an alternator. (8)

Or

- (b) Describe the various methods of starting the synchronous motor. (16)
15. (a) Explain the double field revolving theory for operation of single phase induction motor. (16)

Or

- (b) Explain the following with neat diagrams  
(i) Stepper motor. (8)  
(ii) Hysteresis motor. (8)