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Name.....

Reg. No.....

**FIFTH SEMESTER B.TECH. (ENGINEERING) [09 SCHEME] DEGREE  
EXAMINATION, NOVEMBER 2015**

EE/PTEE 09 501—SYNCHRONOUS AND INDUCTION MACHINES

Time : Three Hours

Maximum : 70 Marks

**Part A**

*Answer all questions.*

1. Why is the field system of an alternator made as a rotor ?
  2. What is synchronizing power of an alternator ?
  3. Why a synchronous motor is a constant speed motor ?
  4. Why starter is necessary for the induction motors ?
  5. Why the most of the  $3\phi$  induction motor constructed with delta are connected stator winding ?
- (5 × 2 = 10 marks)

**Part B**

*Answer any four questions.*

6. Explain distribution factor and short chording factor.
  7. Discuss the effects of change of excitation.
  8. Discuss any *two* starting methods of synchronous motor.
  9. Explain principle of operation of Induction generator.
  10. Explain the concept of single phasing.
  11. Explain briefly the working of Linear induction motor.
- (4 × 5 = 20 marks)

**Part C**

*Answer all questions.*

12. (a) Explain the phenomenon of armature reaction in alternator for different load power factors.
- Or*
- (b) Explain clearly the ZPF method of determining the regulation of an alternator.
13. (a) Explain the effect of variable excitation on the behaviour of the synchronous motor under constant load conditions.
- Or*
- (b) Derive an expression for the maximum torque developed per phase of a synchronous motor.

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14. (a) With the help of necessary sketches, describe the features in the construction of cage and slip ring type induction motor.

Or

- (b) An 8 pole, 3-phase induction motor running with the slip of 4% takes 20KW from a 50Hz supply. Stator losses amount to 0.5KW. If the mechanical torque lost in friction is 16.2 Nm. Find the power output and efficiency.
15. (a) State the different methods of starting of 3-phase induction motor and discuss detail any two methods.

Or

- (b) Using double revolving field theory, explain why a single-phase induction motor is not self starting ?

(4 × 10 = 40 marks)