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**Question Paper Code : 21507**

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2015.

Fifth Semester

Electrical and Electronics Engineering

EE 2302/EE 52/EE 1301/10133 EE 505 — ELECTRICAL MACHINES — II

(Regulations 2008/2010)

(Common to PTEE 2302/10133 EE 505 – Electrical Machines II for B.E. (Part-Time)  
Fourth Semester Electrical and Electronics Engineering – Regulations 2009/2010)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. Define armature reaction.
2. What are all the various methods to determine the voltage regulation?
3. What are the methods of starting a synchronous motor?
4. What are the applications of synchronous motor?
5. Why the rotor slots are made skewed by a small angle to the shaft axis?
6. What is the difference between squirrel cage type rotor and phase wound rotor?
7. What is the effect of variation of supply voltage in an induction motor?
8. What are the different methods of speed control of three phase induction motor?
9. How can the direction of rotation of capacitor-start motor be reversed?
10. What is a linear induction motor?

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PART B — (5 × 16 = 80 marks)

11. (a) A 3-phase, 11 kV star connected alternator delivers a current of 80A at
- (i) 0.8 power factor leading,
  - (ii) Unity power factor and
  - (iii) 0.75 power factor lagging. Full load current of 80A is produced on short circuit by a field excitation of 2.8A. An EMF of 400V per phase is produced on open circuit by the same excitation. The armature resistance is 0.7 ohm per phase. Determine the voltage regulation in each phase. (16)

Or

- (b) Explain the two reaction theory of salient pole alternator. (16)
12. (a) Draw the simplified equivalent circuit of synchronous motor and explain the effect of loading in synchronous motor at various power factors with help of phasor diagrams. (16)

Or

- (b) Write a brief note on the following :
- (i) Operation of synchronous motor at variable excitation. (10)
  - (ii) Method of starting of synchronous motor. (6)
13. (a) Develop and explain the equivalent circuit of three phase induction motor. (16)

Or

- (b) The test readings of a three phase 14.71kW, 400V, 50Hz, star connected induction motor is given below :

No load test : 400V, 9A,  $\cos \phi = 0.2$

Short circuit test : 200V, 50A,  $\cos \phi = 0.4$ .

From the circle diagram find

- (i) line current
- (ii) power factor
- (iii) slip
- (iv) efficiency at full load.

Also find the maximum power output. (16)

14. (a) Explain the various method of starting of three phase squirrel cage type Induction motor. (16)

Or

- (b) Explain the different methods by which speed control of induction motor is achieved. (16)

15. (a) Explain, why single phase induction motor is not self starting? Also explain about the Double revolving filed theory. (16)

Or

- (b) Write the brief note about the following :

- (i) Repulsion motor (5)  
(ii) Hysteresis motor (5)  
(iii) AC series motor. (6)
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