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Question Paper Code : 41230

B.E./B.Tech. DEGREE EXAMINATION, NOVEMBER/DECEMBER 2013.

Fifth Semester

Electrical and Electronics Engineering

080280039 — ELECTRICAL MACHINES — II

(Regulation 2008)

Time : Three hours

Maximum : 100 marks

Answer ALL questions.

PART A — (10 × 2 = 20 marks)

1. State the principle of operation of alternator.
2. What are the significances of parallel operation?
3. What are the advantages of synchronous motor?
4. What are the causes for faulty starting of a synchronous motor?
5. What factor determines the direction of rotation of induction motor?
6. What is meant by crawling?
7. What is meant by plugging?
8. What happens if a stationary 3-phase induction motor is switched on with one phase disconnected?
9. How will you reverse the direction of 1-phase induction motor?
10. State the principle of operation of reluctance motor.

PART B — (5 × 16 = 80 marks)

11. (a) The stator of a 3-phase, 16-pole alternator has 144 slots and there are 4 conductors per slot connected in two layers and the conductors of each phase are connected in series. If the speed of the alternator is 375 rpm, calculate the e.m.f induced per phase. Resultant flux in the air-gap is 5×10^{-2} webers per pole with sinusoidal distribution. Assume the coil span as 150° electrical.

Or

- (b) Explain about determination of voltage regulation of alternator experimentally by E.M.F method.

12. (a) Explain about the effect of excitation on armature current and power factor of synchronous motor.

Or

- (b) (i) Derive the expression for power developed in a synchronous motor.
(ii) Write the procedure for starting a synchronous motor.
13. (a) A three phase slip ring induction motor with star-connected rotor has an induced emf of 120V between slip-ring at stand still with normal voltage applied to the stator. The rotor winding has a resistance per phase of 0.3 ohm and stand still leakage reactance per phase of 1.5 ohm.

Calculate

- (i) Rotor current per phase when running short-circuited with 4 percent slip and
(ii) The slip and rotor current per phase when rotor is developing maximum torque.

Or

- (b) With schematic explain the construction and operation of an induction motor.
14. (a) Explain any two types of induction motor starter.

Or

- (b) Briefly explain about speed control of induction motor.
15. (a) Write in detail about the principle and operation of shaded pole induction motor.

Or

- (b) Explain about the construction and operation of stepper motor.
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