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H – 4427

**Sixth Semester B. Tech Degree Examination, January 2020**

**(2013 Scheme)**

**13.602 INDUCTION MACHINES AND SPECIAL  
ELECTRICAL MACHINES (E)**

Time : 3 Hours

Max. Marks : 100

**PART – A**

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

1. Derive the expression for frequency of rotor induced emf of a 3 phase induction motor.
2. Write short note on crawling of induction motors.
3. What is the necessity of short circuited rotor conductors in a squirrel cage induction motor?
4. Mention the applications of induction generator.
5. Compare star delta starter with DOL starter.
6. Write short notes on plugging in an induction motor.
7. Briefly explain the principle of operation of a universal motor.
8. What is the purpose of shading coil in a shaded pole motor?
9. What is a stepper motor? What are the different types of stepper motors?
10. What are the application of reluctance motor?

**(10 × 2 = 20 Marks)**

P.T.O.



PART – B

Answer **any one** full question from each Module.

**Module I**

11. (a) With neat diagram explain the constructional details of a 3 phase induction motor. Also explain different types of induction motors according to rotor construction. **12**
- (b) A 3- phase, 50Hz, 6- pole induction motor runs at 940 r.p.m. and delivers 7kW output. What starting torque will the motor develop when switched directly on to the supply, if maximum torque is developed at 800 rpm. The total friction and windage losses are 860W. **8**

Or

12. (a) Explain from basics the working principle of a 3 phase induction motor. **10**
- (b) A 6 – pole, 50Hz, 3- phase induction motor runs at 960 r.p.m. When the torque on the shaft is 200 N-m. If the stator losses are 1500W and friction and windage losses are and 500W, find
- (i) rotor Cu loss and
- (ii) efficiency of the motor. **10**

**Module II**

13. (a) Explain with suitable diagram, the speed control of induction motor by cascade connection. Mention the advantages and disadvantages of this method. **12**
- (b) Explain the working of a self-excited induction generator. **8**

Or

14. (a) Draw and explain the connections of stator windings of 3 phase induction motor for Dynamic braking. What are the advantages of this method? **10**
- (b) What is a synchronous induction motor? Explain the characteristics and advantages of a synchronous induction motor. **10**

