

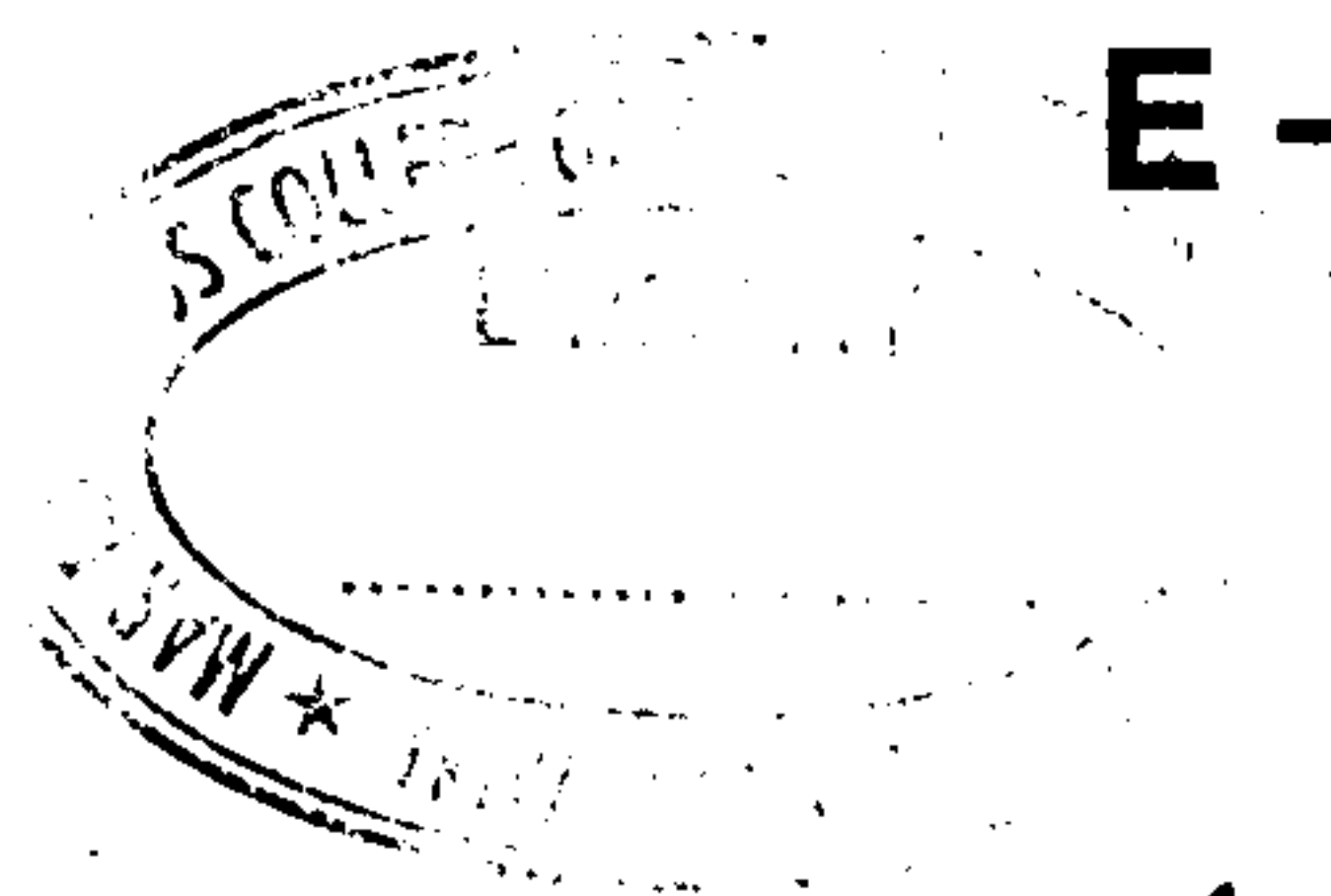


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E – 1994

Reg. No. :

Name :



**Sixth Semester B.Tech. Degree Examination, May 2018
(2013 Scheme)**

13.602 : INDUCTION MACHINES AND SPECIAL ELECTRICAL MACHINES (E)

Time : 3 Hours

Max. Marks : 100

PART – A

Answer **all** questions :

(2×10=20 Marks)

1. What is blocked rotor test on induction motor ?
2. An induction motor is supplied with a frequency of 50 Hz, find the rotor current frequency when the machines is running at 4% slip ?
3. How can we reduce level of noise produced in induction motor ?
4. What is the need of starters in induction motor ?
5. How the locus of current of induction motor follows a circle ?
6. What is plugging in induction machine and how it can be achieved in 3 phase IM ?
7. Illustrate how shading a pole cause torque in shaded pole motor ?
8. Give an example for speed control of universal motor.
9. Why heavy traction vehicles like train do not use linear induction motor ?
10. List the advantages of brushless d.c. motor.

PART – B

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

(20×4=80 Marks)

Module – I

11. a) Explain the working principle of three phase squirrel cage induction motor. **8**
- b) A 440 V, 50 Hz, 6 pole, 3 phase induction motor draws an input power of 75 kW from the mains. The rotor emf makes 120 complete cycles per minute. If stator losses are 2 kW and rotor current per phase is 60 A, calculate (a) rotor copper losses per phase, (b) rotor resistance per phase, (c) torque developed. **12**

OR

P.T.O.



12. a) Draw the circle diagram of the 400V, 50Hz, 3 phase delta connected induction motor from the following data ? Assume stator Cu drop is equal to rotor Cu loss. Find out full load torque, full load current, full load rotor Cu loss, full load slip and full load power factor. 15

	Voltage (V)	Current (A)	Power (W)
No load test	400	3.0	650
Blocked rotor test	200	12.0	1600

- b) Comment of unbalanced supply on the performance of induction motor. 5

Module – II

13. a) Explain on V/f control of induction motor. 10
 b) A three phase 440 V, 100 rpm slip ring induction motor is operating with a slip of 2% and taking a stator current of 65 A. Speed of the motor is reduced at constant torque to 600 rpm using stator voltage control. Calculate the new value of stator current. 10

OR

14. a) What are self excited induction generators ? How can they be employed in wind power applications ? 10
 b) Explain in steps the procedure for drawing circle diagram of an induction generator. 10

Module – III

15. a) Explain the different methods employed as starting methods of single phase induction motor. 15
 b) Why interpoles are employed in a.c. series motor ? 5

OR

16. a) Explain with a neat diagram, the working of a universal motor. 10
 b) What is permanent magnet armature controlled d.c. servomotors ? How they are employed for servo applications ? 10

Module – IV

17. a) With the help of a cross sectional diagram, explain the working of linear induction motor. 10
 b) What are stepper motors ? Briefly explain the working. How speed is controlled in stepper motor ? 10

OR

18. Briefly explain on the following :

i) Types of brushless motor. 5

ii) Maglev trains. 5

iii) Reluctance and switched reluctance motor. 10