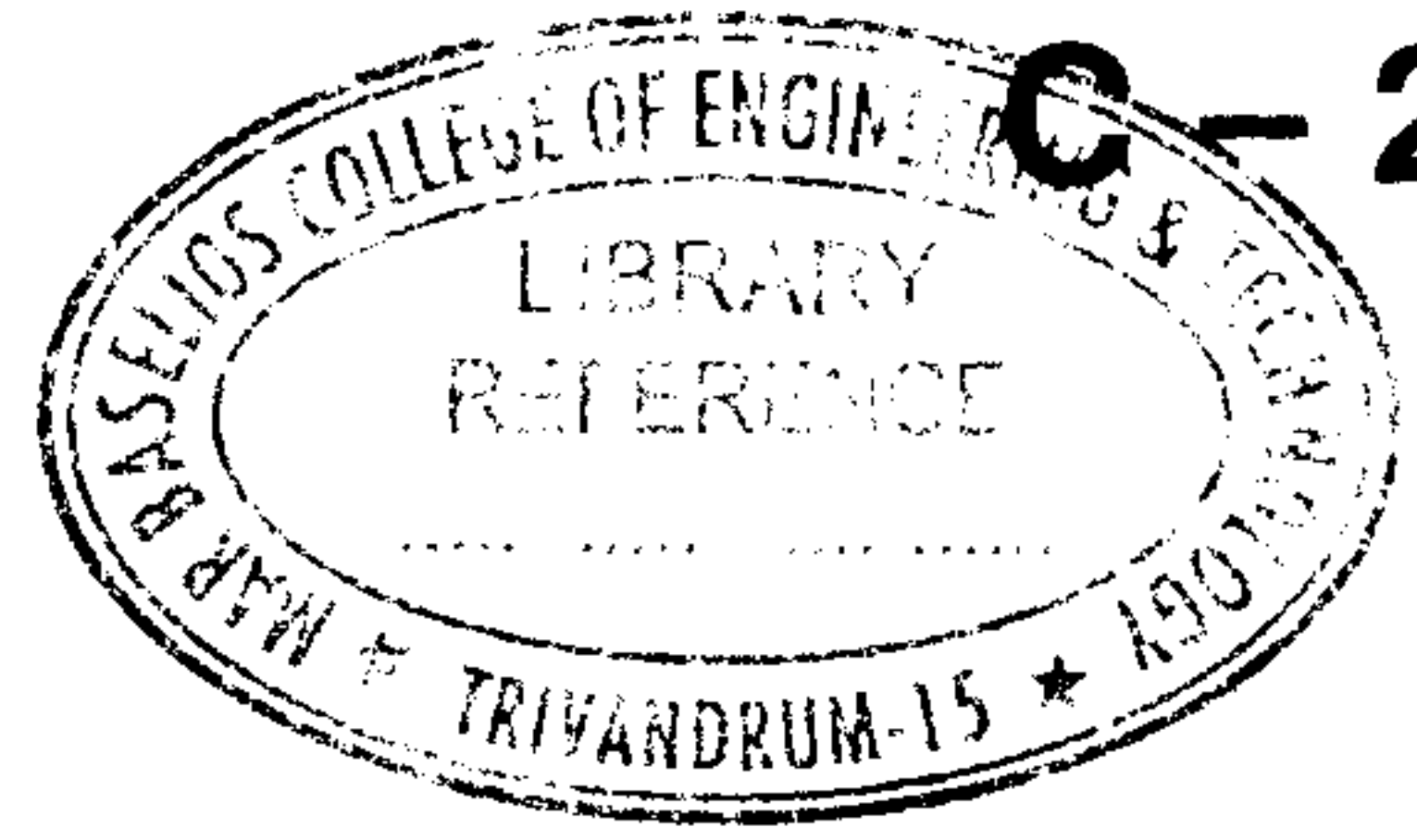




(Pages : 3)



C-2758

Reg. No. :

Name :

**Sixth Semester B.Tech. Degree Examination, June 2017
(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 cogging in induction machine ? How it can be avoided ?
2. Briefly explain the concept of conducting no load test on rated voltage and blocked rotor for rated current for an induction motor.
3. What are the advantages of slip ring induction motor over squirrel cage induction motor ?
4. List out the benefits of using stator resistance starters in induction motor.
5. What is double cage induction motor ?
6. Why single phase induction motor is not self starting ?
7. Why universal motor is called as '*Universal*' motor ?
8. Illustrate the construction of shaded pole motor.
9. Give the various applications of stepper motor.
10. What are 'MAGLEV' trains ?

P.T.O.



PART – B

Answer **one full** question from **each** Module :**(20×4=80 Marks)****Module – I**

11. a) With the help of a neat diagram explain the constructional features of a squirrel cage induction motor. **10**
- b) Derive the expression for rotor torque developed in a three phase induction motor. Also find the condition for maximum running torque. **10**

OR

12. a) What is the effect of unbalanced supply on 3 phase induction motor ? **5**
- b) Draw the circle diagram for a 5 HP, 200 V, 50 Hz, 4 pole, 3 ϕ star connected induction motor from the following data :
- i) 200V, 5A, 350W
 - ii) 100V, 26A, 1700W
 - iii) Rotor copper loss at standstill is half of the total copper loss. Estimate the full load current, power factor, speed and torque. **15**

Module – II

13. a) Explain on different starters used for induction motor. **10**
- b) A squirrel cage induction motor, when started by means of a star delta starter takes 150% of full load line current and develops 45% of full load torque at starting. Calculate the starting torque and current in percentage of full load current and full load torque, if an autotransformer with 75% tapping were employed. **10**

OR

14. a) With a neat diagram explain the method of cascaded speed control of induction motor. Also give the practical difficulties in implementing this type of speed control. **10**
- b) Explain on V/F control of induction motor. **10**



Module – III

15. a) Explain with the help of torque-slip graph and necessary equations the working of single phase induction machine by two-reaction theory. **10**
b) Derive the expression for average torque developed in an AC series motor. **10**

OR

16. a) What are servo motors ? Explain on armature controlled of servomotors. **10**
b) What are the modifications and improvements required in a d.c. series motor to work as an a.c. series motor ? **10**

Module – IV

17. a) Derive and show that the eddy current torque is maximum at starting for a reluctance motor. Also draw the ideal torque slip characteristics of a reluctance motor. **10**
b) How does a brushless d.c. motor works without brushes ? **5**
c) Comment on possibility of a magnetic levitated train route in India. **5**

OR

18. a) With an example of a two phase stepper motor and its step sequence explain the working and control of a stepper motor. **15**
b) What are the different types of 'LIM' ? **5**

