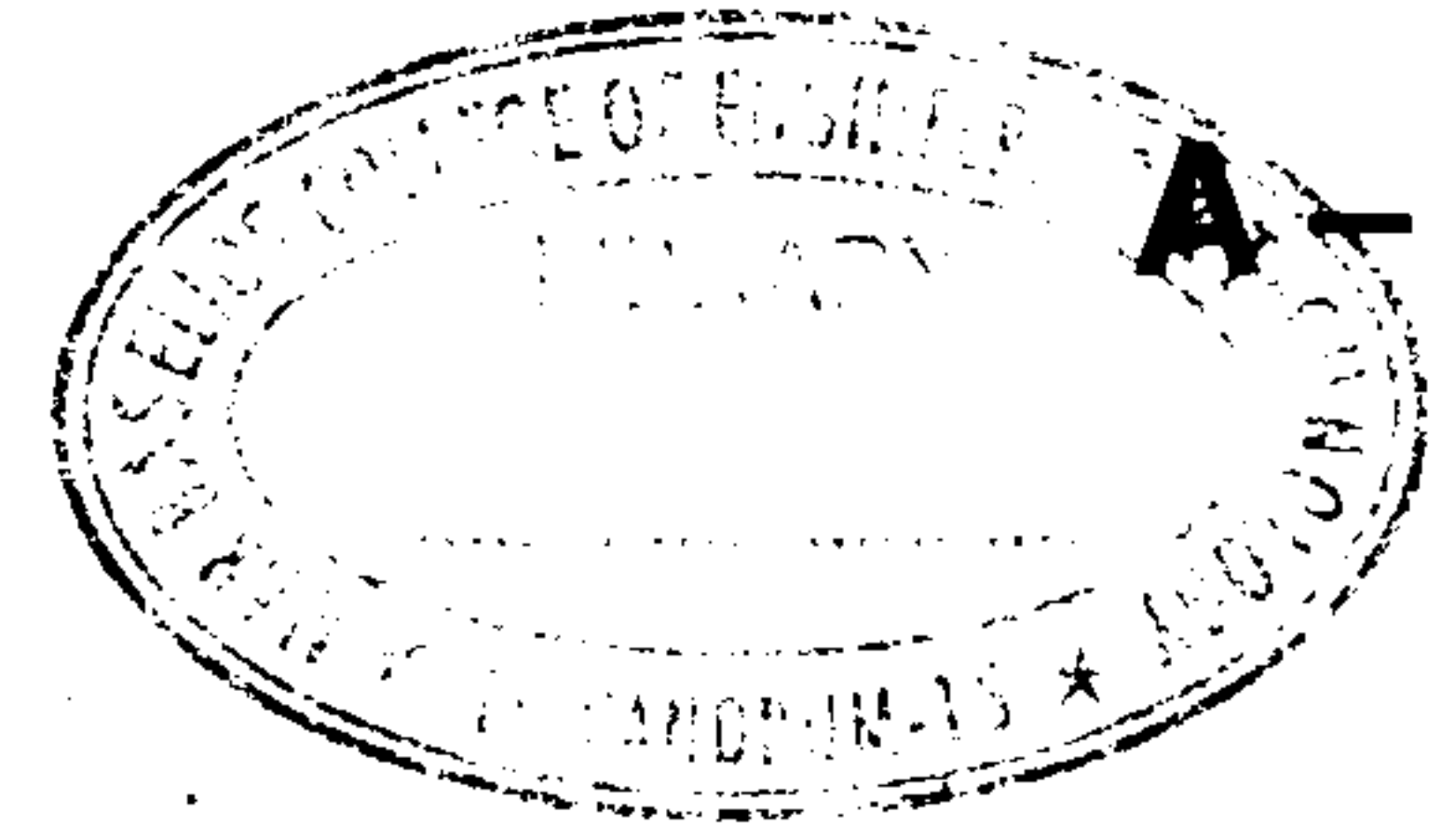




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A - 6377

Reg. No. :

Name :

**Fifth Semester B.Tech. Degree Examination, September 2016
(2008 Scheme)
08.502 : ELECTRICAL TECHNOLOGY (MPU)**

Time : 3 Hours

Max. Marks : 100

Instruction : Answer all questions from Part A and one full question from each Module of Part B.

PART - A

1. Derive the emf equation of a dc machine.
2. Draw the torque-speed characteristic of a dc series motor. Mention its applications.
3. What are the power losses in a dc machine ? What is the condition for maximum efficiency ?
4. What is meant by all day efficiency ? How is it different from ordinary efficiency ?
5. Explain the working principle of a three phase induction motor.
6. Explain the star delta method of starting of a three phase squirrel cage induction motor.
7. Derive the expression for frequency of induced emf of an alternator.
8. Why is a single phase induction motor not self starting ?
9. What is a synchronous condenser ? What is its industrial application ?
10. What are the speed control methods of a dc series motor ?

(10x4=40 Marks)

P.T.O.



PART – B

Answer **one full** question from **each** Module. **All** questions carry **equal** marks.

(20×3=60 Marks)

Module – I

11. a) What is critical speed of a dc shunt generator ? How is it determined ?
- b) A shunt generator delivers 195 A at terminal Pd of 250 v. The armature resistance and shunt field resistance are 0.02 ohm and 50 ohm respectively. The iron and friction losses equal 950 w
- Find a) emf generated b) copper losses
c) output of prime mover d) efficiency

OR

12. a) Explain the different types of dc generators.
- b) An 8 pole dc shunt generator has 778 wave connected armature conductors running at 500 rpm, supplies a load of 12.5 ohms resistance at a terminal voltage of 250 v. The armature resistance is 0.24 ohm and field resistance is 250 ohms. Find out the armature current, induced emf and flux per pole.

Module – II

13. a) With neat circuit diagrams, explain how OC and SC tests are done on single phase transformer. Explain how equivalent circuit parameters are obtained.
- b) Derive an expression for saving of copper in an autotransformer.

OR

14. a) Derive the condition for maximum running torque of a 3 phase induction motor.
- b) The power input to the rotor of a 440 v, 50 Hz, 3 phase, 6 pole induction motor is 60 kw. The rotor emf makes 90 complete cycles per minute. Calculate 1) the slip 2) the rotor speed 3) rotor copper loss and 4) mechanical power developed.



Module – III

15. a) Explain the construction and working of universal motor.
- b) A 3 phase star connected synchronous generator is rated at 1.5 MVA, 11 kV. The armature effective resistance and synchronous reactance are 1.2 ohm and 25 ohms respectively per phase. Calculate the percentage voltage regulation for a load of 1.4375 MVA at 0.8 pf lagging.

OR

16. a) Draw and explain the functional schematic of ac electric locomotive.
- b) Explain the different types of split phase motors.

