



Reg. No. :

Name :

**Third Semester B.Tech. Degree Examination, November 2013
(2008 Scheme)**

08.306 – ELECTRICAL MACHINES – 1 (E)

Time: 3 Hours

Max. Marks : 100

Instruction : Answer **all** questions from Part – **A** (4 marks **each**) and **any one** question of Part – **B** from **each** Module (20 marks **each**).

PART – A



1. Explain voltage building up process in a DC shunt generator.
2. Why DC motors are not self starting ?
3. Explain the function of compensating winding in a DC machine.
4. Explain condition to be satisfied successful parallel operation of a DC shunt generator.
5. Draw performance characteristics of a DC compound motor.
6. With neat diagram explain the difference between lap-winding and wave-winding.
7. What are the different methods for cooling power transformer ?
8. Why transformers are rated in KVA ?
9. What is meant by all-day efficiency of distribution transformer ?
10. Draw phasor diagram of a transformer with capacitive load.



PART – B

Module – I

11. a) What is commutation ? Explain the possible reasons for sparking during commutation. What are the methods for improving commutation ? Explain. 10
- b) A 400 V, 450 kw, 8 pole lap connected dc generator has 768 armature conductor. If the brushes are given a lead of 6° electrical. Calculate the cross magnetising and demagnetising ampere turns at full load. Shunt field current may be neglected. 10

OR

12. a) A shunt generator have the following magnetising characteristics :

If (A)	0	0.5	1.0	1.5	2.0
E (V)	4	42	78	93	100

Calculate the values of critical resistance. Also find the value of OC voltage when field resistance is 60Ω . 10

- b) Derive an expression for demagnetising and cross magnetising AT/pole. 10

Module – II

13. a) What are the speed control methods in a DC series motor ? Explain with diagrams. 10
- b) Explain different types of braking in DC motor. 10

OR

14. a) Explain with the help of a neat diagram method to find rotational losses by retardation test. 8
- b) The no load test of a 44.76 kw, 220 V dc shunt motor gave the following figures. Input current = 13.25 A field current = 2.55 A, hot value of armature resistance = 0.032Ω . Brush drop = 2V. Estimate the full load armature current and efficiency when working as (1) generator (2) motor. 12



Module – III

15. a) Find all day efficiency of a transformer having maximum efficiency of 95 % at 10 KVA ups and loaded as follows 12 hours – 2 kw 0.5 pf lag, 6 hours – 5 kw at 0.7 lag 6 hours at no load. 10
- b) Derive the expression for circulating current when two transformers with unequal turns ratio are operating in parallel. 10

OR

16. a) A 12 KVA, 1000/100 V, 50 Hz , 1 ϕ transformer has the following results :
OC test : LV side 100V, 0.7A, 85W
SC test : HV side, 60V, 10A, 95W
Determine (i) Equivalent resistance and leakage reactance reflected to HV side
(2) Regulation of transformer at full load and half load at 0.8 lagging. 10
- b) Explain the working of on load tap changing transformer. What are the advantages and disadvantages of tap changing transformers ? 10

