E – 4176

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Reg. No. : .....

Name : .....

Fourth Semester B.Tech. Degree Examination, August 2018
(2013 Scheme)
13.403 – ELECTRICAL TECHNOLOGY (MP)

Time : 3 Hours Max. Marks : 100

PART – A

Answer **all** questions.

1. What is the function of armature in a dc generator ?
2. Give two applications of series motor and shunt motor each.
3. Calculate the flux per pole required for a 4-pole generator with 360 conductors generating 250 V at 1000 rpm. When armature is i) Lap wound ii) Wave wound.
4. Write down the emf equation of transformer.
5. What is the necessity of starter in a three phase induction motor ?
6. Sketch the V curve of a synchronous motor.
7. What are the merits and demerits of stepper motor ?
8. Define electric traction.
9. What is meant by electric braking ?
10. What type of dc generator is suitable for electric welding ? Explain the reason. **(10×2=20 Marks)**

PART – B

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

Module – 1

11. a) Draw and explain the external characteristics of shunt, series and compound generators. **12**

P.T.O.

b) The OCC of a dc shunt generator at 300 rpm is :

I_f(A) :	0	0.2	0.3	0.4	0.5	0.6	0.7
E_o(v) :	7.5	93.0	135.0	165.0	186.0	202.0	215.0

The field resistance is adjusted to 354.5 Ω and the speed is 300 rpm. Determine the following :

i) Graphically the no-load voltage

ii) Critical field resistance

iii) Critical speed for the given field resistance

iv) Additional resistance inserted in the field circuit to reduce the no load voltage to 175 V. **8**

12. a) What are the important characteristics of dc motors ? Sketch all these characteristics of dc series motor. **10**

b) A 10 hp, 230 v shunt motor has an armature resistance of 0.5 Ω and field circuit resistance of 115 Ω. At no load and rated (full) voltage the speed is 1200 rpm and armature current is 2 A. If load is applied, the speed drops to 1100 rpm. Determine the armature current and the line current. **10**

Module – 2

13. a) Describe the procedure for conducting OC and SC tests in a single phase Transformer. **10**

b) Two transformer 100 KVA, unity power factor each has a maximum efficiency of 98% but in one of maximum efficiency occurs at full load while in the other it occurs at half load. Each transformer is on full load for 4 hours, on half load for 6 hours and one-tenth load for 14 hours per day. Determine the all day efficiency of each transformer. **10**

14. a) What is the principle underlying the operation of slip ring induction motor ? **10**

b) Draw and construct the circle diagram of induction motor. Explain it briefly. **10**

Module – 3

15. a) Compare split phase motor and capacitor start motor. **8**

b) Explain the construction and operating principle of stepper motor. **12**

16. a) Describe any two starting method of synchronous motor. **10**

b) Explain the procedure for determining the regulation of alternator by EMF method. **10**

Module – 4

17. a) Explain the various types of motors used in traction system. **15**

b) Draw and explain the functional schematic of an ac electric locomotives. **5**

18. a) What are the various methods of speed control used in traction motors ? Explain any two of them. **10**

b) Discuss the different types of electric welding. **10**