Code No: RT21026 **R13** SET - 1

II B. Tech I Semester Supplementary Examinations, May/June - 2017
ELECTRICAL MACHIENS-I
(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 70

Note: 1. Question Paper consists of two parts (**Part-A** and **Part-B**)
2. Answer **ALL** the question in **Part-A**
3. Answer any **THREE** Questions from **Part-B**

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PART –A

1. a) Distinguish the differences between lap and Wave windings (4M)
   b) Distinguish between armature winding and field winding (4M)
   c) Explain the concept of reactance voltage in DC Machine (4M)
   d) Define the Distribution factor for a DC Machine (3M)
   e) What is the effect of brush lead in a DC Motor (3M)
   f) What is Hopkinson's test and where is it applied (4M)

PART -B

2. a) Why most practical energy conversion devices use magnetic field as the coupling medium between electrical and mechanical systems? (8M)
   b) State the electromagnetic phenomena useful for the electromagnetic energy conversion in rotating electric machines (8M)

3. a) From the construction point of view, enumerate the common essential features of rotating electrical machines (8M)
   b) A separately excited generator, when running at 1000 rpm supplied 200 A at 125 V. What will be the load current when the speed drops to 800 rpm. If field current is unchanged? Given the armature resistance = 0.04Ω and brush drop = 2V. (8M)

4. a) Explain why the emf generated in the armature of a DC Motor is called 'back emf' (8M)
   b) The armature of a 4 pole lap wound dc machine has core length = 40 cm, diameter = 50 cm, total conductors = 500, speed =1200 rpm and current = 20 A. For an average flux density of 0.5 T, find the electromagnetic (or gross mechanical) power developed and the internal torque. (8M)

5. a) Explain the different methods of improving commutation in DC machines (8M)
   b) Two shunt generators running in parallel supply a load of 5000A. Each machine has an armature resistance of 0.03Ω and a field resistance of 60Ω. The emf's of the two machines are 600 V and 640 V respectively. Calculate the power output of each machine (8M)

6. a) Explain with a neat connection diagram , the working of a Three point starter used for a DC Shunt motor (8M)
   b) A 230 V dc Shunt motor takes 32 A at full load. Find the back emf on full load if the resistances of motor armature and shunt field windings are 0.22 ohms and 120 ohms respectively (8M)

7. Write short notes on the following: i)Output equation of DC Machine with respect to design concept ii)Retardation test (16M)
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