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Total No. of Pages : 02

Total No. of Questions : 09

B.Tech.(Automation & Robotics) (2012 & Onwards)
ELECTROMECHANICAL ENERGY CONVERSION & DC MACHINES
(Sem.-6)
Subject Code : EE-202
M.Code : 71063

Time : 3 Hrs.

Max. Marks : 60

INSTRUCTION TO CANDIDATES :

1. SECTION-A is COMPULSORY consisting of TEN questions carrying TWO marks each.
2. SECTION-B contains FIVE questions carrying FIVE marks each and students have to attempt any FOUR questions.
3. SECTION-C contains THREE questions carrying TEN marks each and students have to attempt any TWO questions.

SECTION A**1. Answer briefly :**

- a) Give working principle of generator.
- b) State Lenz law.
- c) Why the core of a machine is laminated?
- d) What is armature reaction in dc machines?
- e) What is regenerative braking used in dc machines?
- f) Define field energy & coenergy.
- g) What is the purpose of compensating winding in cross field generators?
- h) Define the term induced torque & reluctance torque.
- i) Why starters are used in dc machines?
- j) Give the working principle of metadyne.

SECTION-B

2. Show that the energy stored in a magnetic field is equal to the area between Φ -F curve for the system & the flux axis.
3. Derive an expression for electromagnetic torque in an AC machine with cylindrical air gap. State the assumptions made.
4. Draw & explain torque vs. armature current & speed vs. armature current characteristics of a series motor.
5. Draw & explain the construction & working of 3 point starter.
6. Discuss the principle of operation & characteristics of an amplidyne.

SECTION-C

7. Draw and explain the open circuit characteristics of shunt generator. Hence give the conditions for build up of voltage in it.
8. A series motor with an unsaturated magnetic circuit & 0.5 ohm total resistance, when running at a certain speed takes 60 A at 500 V. If the load torque varies as the cube of the speed, calculate the resistance required to reduce the speed by 25%.
9. The Hopkinson test on two shunt machines gave the following results for full load line voltage 250V, line current excluding field currents 45A, motor armature current 385A, field currents 5A and 4.0A. Calculate the efficiency of each machine. Armature resistance of each machine 0.015 ohm.

NOTE : Disclosure of Identity by writing Mobile No. or Making of passing request on any page of Answer Sheet will lead to UMC against the Student.