

ASSIGNMENT: 7 IMPORTANT EXAMPLE ON DC MOTOR & GENERATOR

1. What is armature reaction? Discuss any one method to counterbalance armature reaction.
2. Draw the circuit diagram and explain the Hopkinson's test for DC shunt Machines in detail.
3. Explain critical field resistance of d.c. shunt generator with its significance.
4. A 4-pole 250V wave-connected shunt motor gives 10Kw when running at 1000 r.p.m. and drawing armature and field currents of 60A and 1A respectively. It has 560 conductors. Its armature resistance is 0.2Ω . Assuming a drop of 1V per brush, determine (a) total torque; (b) useful torque; (c) useful flux per pole (d) rotational losses; (e) efficiency.
5. A 4-pole, long-shunt lap wound generator supplies 25 kW at a terminal voltage of 500 V. The armature resistance is 0.03Ω , series field resistance is 0.04Ω and shunt field resistance is 200Ω . The brush drop may be taken as 1V. Determine the e.m.f. generated. Also calculate the No. of conductors if the speed is 1200 r.p.m. and flux per pole is 0.02 Weber. Neglect armature reaction.
6. The Hopkinson's test on two identical shunt machines gave the following results: Input voltage = 500 V; input current = 15 A; output current of generator = 120A; Field current of generator = 4 A Field current of motor = 3 A Armature resistance of each machine = 0.06Ω . Find the efficiency of motor and generator.
7. A long shunt dynamo running at 1000rpm supplies 20KW at 220V and 85% efficiency. The resistance of shunt, series and armature windings are 0.04Ω , 110Ω and 0.05Ω respectively. Find Copper loss and Iron-friction loss.
8. Explain the Swinburne's test on DC motor with circuit diagram.