**Worksheet-12**

**DC Generator**

1. A 6-pole 2 circuit wave connected armature has 250 conductors and runs at 1200 rpm. The electromotive force generated on open circuit is 600 V. Determine the useful flux per pole. **[0.04Wb]**
2. An 8-pole lap connected armature has 960 conductors, a flux of 40m Wb per pole and a speed of 400 rpm. Determine the emf generated. **[256 V]**
3. A 4-pole generator has a flux of 40 mWb per pole and a lap connected armature with 740 conductors.  Determine the emf generated on open circuit at 1000 rpm. **[Ans. 494 V]**
4. When driven at 1000 r.p.m. with a flux per pole of 0.02 Wb, a d.c. generator has an e.m.f. of 200 V. If the speed is increased to 1100 r.p.m. and at the same time the flux per pole is reduced to 0.019 Wb per pole, what is then the induced e.m.f.? **[209 V]**
5. An 8-pole lap-wound d.c. generator has 120 slots having 4 conductors per slot. If each conductor can carry 250 A and if flux/pole is 0.05 Wb, calculate the speed of the generator for giving 240 V on open circuit. If the voltage drops to 220 V on full load, find the rated output of the machine. **[600 V, 440 kW]**
6. Calculate the flux per pole required on full-load for a 50 kW, 400 V, 8-pole, 600 r.p.m. d.c. shunt generator with 256 conductors arranged in a lap-connected winding. The armature winding resistances is 0.1 Ω, the shunt field resistance is 200 Ω and there is a brush contact voltage drop of 1 V at each brush on full- load. **[0.162 Wb]**
7. A 4-pole machine running at 1500 r.p.m. has an armature with 90 slots and 6 conductors per slot. The flux per pole is 10 mWb. Determine the terminal e.m.f. as d.c. Generator if the coils are lap-connected. If the current per conductor is 100 A, determine the electrical power. **[810 V, 324 kW]**
8. A short-shunt compound d.c. Generator supplies a current of 100 A at a voltage of 220 V. If the resistance of the shunt field is 50 Ω, of the series field 0.025 Ω, of the armature 0.05 Ω, the total brush drop is 2 V. Calculatethe generated e.m.f. **[229.7 V]**
9. Describe the construction of a de machine and explain what materials are used for each component
10. Explain the functions of brushes and commutator in a de machine.
11. Why are some parts of a de machine laminated?