1304 **Code : 15EE31T**

Register Number | | | | | | | | | | |

III Semester Diploma Examination, Nov./Dec.-2018

DC MACHINES & ALTERNATORS

Time : 3 Hours] **[Max. Marks : 100**

Note : (i) Answer any **six** full questions from Part-**A**. Each question carries **5** marks.
(ii) Answer any **seven** full questions from Part-**B**. Each question carries **10** marks.

PART – A

1. Draw a neat sketch of a DC generator and label the parts. **5**

2. List the types of D.C. generators and draw circuit diagram for any 2 types. **5**

3. Explain Demagnetizing and Cross-magnetizing effects of armature reaction of a D.C. generator. **5**

4. A 4 pole DC generator has a lap wound armature having 32 slots and 8 conductors per slot runs at 1500 rpm. If the flux per pole is 0.04 wbs, calculate the emf induced in the armature. What would be the emf induced, if the winding is wave connected ? **5**

5. Explain the necessity of starters for D.C. Motors. **5**

6. Explain the working principle of alternators. **5**

7. Draw the Vector diagrams of alternator on load at **5**
   (i) Zero lagging P.f
   (ii) Zero leading P.f
   (iii) Unity P.f

8. Explain hunting in alternator and mention any two methods to prevent it. **5**

9. List the applications of Servo Motors. **5**

PART – B

10. (a) Derive an emf equation of a D.C. generator. 5
    (b) Mention the rules and list applications of wave winding. 5

11. Explain the O.C.C. of a D.C. shunt generator with sketch. 10

12. (a) Define torque and write expressions for shaft torque & armature torque. 5
    (b) The power input to a 230 V, DC shunt motor is 8.477 kw. The field resistance is 230 Ω and armature resistance is 0.28 Ω. Find the input armature current and back emf. 5

13. Explain torque Vs load, torque Vs speed and speed Vs load characteristics of DC Series motor. 10

14. (a) List the application of DC Shunt motor. 5
    (b) A 230V, DC shunt motor takes a current of 40 A and runs at 1100 rpm. If armature and shunt field resistances are 0.25 Ω and 230 Ω respectively. Find the torque developed by the armature. 5

15. (a) Explain the construction of Salient pole type rotor of an alternator. 5
    (b) Mention the advantages and disadvantages of fractional Pitch Winding in alternator. 5

16. (a) Derive an equation for emf generated in a 3 phase alternator. 5
    (b) A 2200 V, 3 phase alternator is running at 300 rpm and has 24 poles. Find the number of conductors in the stator winding, if the magnetic flux is 0.055 wbs/pole. Assume distribution factor is 0.97. 5

17. Explain the procedure for conducting O.C. and S.C. test on alternators with circuits. 10

18. (a) Explain the effect of un-equal voltage on load shared by the alternators running in parallel. 5
    (b) Explain the effect of change in excitation on load shared by the alternators running in parallel. 5

19. Explain the construction and working of stepper motor. 10