1655

Code : 15EE31T

Register Number

III Semester Diploma Examination, April/May-2019
DC MACHINES & ALTERNATORS

Time : 3 Hours]

[Max. Marks : 100

Instruction : (i) Answer any **six** 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. Define DC generator and mention the important parts of D.C. generator. 5

2. Derive the EMF equation of a D.C. generator. 5

3. What are internal and external characteristics ? Draw the same for a separately excited DC generator. 5

4. List the applications of 5
   (a) D.C. shunt motor
   (b) D.C. series motor

5. Explain with diagram speed control of D.C. motor by armature control method. 5

6. Describe the construction of non-salient type alternator with a sketch. 5

7. What is excitation ? List the types of excitation. 5

8. State the applications of 5
   (a) Stepper motor
   (b) Universal motor

9. A 16 pole 3-phase alternator has a star connected winding with 144 slots and 10 conductors per slot. The flux per pole is 0.03 Wb distributed sinusoidally and the speed is 375 rpm. Find the frequency the phase and line voltage. Assume full pitched winding. 5

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PART – B

10. (a) Mention the general rules for lap winding.   5

    (b) A D.C. generator of 6 pole, wave connected has 52 slots and each slot has 20 conductors. Find the speed of the generator. The induced emf is 240 V and the flux per pole is 5 mWb.   5

11. (a) Explain with sketch EMF commutation.   5

    (b) Explain the process of voltage build up of a D.C. shunt generator.   5

12. (a) List the causes for the failure of voltage buildup in a D.C. shunt generator.   5

    (b) Describe the working principle of D.C. motors.   5

13. (a) Explain the speed-load characteristics of shunt and series motors.   5

    (b) Explain the speed control of shunt motor by field control method.   5

14. (a) Draw the neat sketch of a 3-point starters and label the parts.   5

    (b) Describe the basic working principle of Alternator.   5

15. (a) Compute the relationship between P, N, F in alternators.   5

    (b) State the importance for running alternatives in parallel. List the conditions for parallel operation.   5

16. (a) Define regulation. List the different methods to determine voltage regulation.   5

    (b) Explain EMF method of finding regulation of an alternator.   5

17. (a) With a neat circuit diagram explain the parallel operation of 3 phase alternators using synchronoscope.   5

    (b) Draw the vector diagrams of alternator on load at different power factors.   5

18. (a) What is Hunting ? How hunting is prevented ?   5

    (b) State the applications of   5

        (i) Brushless D.C. motors

        (ii) Servomotors

19. (a) Explain the construction and working of universal motor   5

    (b) Mention the various losses in D.C. generator and explain.   5