1489

Code : 15EE31T

Register Number | | | | | | | |

III Semester Diploma Examination, Nov./Dec. 2016

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. List any five main parts of DC Generator & name the materials used for them. **5**

2. Explain Demagnetising & Cross magnetising effects of Armature reaction. **5**

3. List the applications of DC Shunt Generator. **5**

4. Define Armature Torque & write expressions for Shaft Torque & Armature Torque. **5**

5. Compare DC Generator action & DC Motor action. **5**

6. Describe the working principle of Alternator. **5**

7. The stator of a 3-phase, 16-pole Alternator has 144 slots & there are 4 conductors/slot connected in two layers & the conductor of each phases are connected in series. If the speed of Alternator is 375 RPM, calculate the EMF induced/phase resultant ϕ in the air gap is 5×10^{-2} Webers/pole sinusoidally distributed. Assume the coil span as 150° electrical.

8. Define effective resistance, leakage reactance & synchronous reactance. **5**

9. Explain the construction & working of Universal Motor. **5**

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PART–B

10. (a) Distinguish Full pitch & Fractional pitched windings.
    (b) List the merits of Hydrogen cooling.

11. (a) Explain the armature reaction in an Alternator with neat sketches.
    (b) Compute the relationship between poles, speed and frequency.

12. (a) Explain hunting in Alternator.
    (b) What do you mean by excitation ? List the types.

13. (a) Explain the procedure for conducting open circuit & short circuit tests on an Alternator with circuit diagram.
    (b) Define voltage regulation. List the methods of determining voltage regulation.

14. Write the applications of (a) Stepper Motor & (b) Servo Motor **10 (5 each)**

15. (a) Explain the construction & operation of DC 3-point starter.
    (b) What is the necessity of starter in case of DC Motors ?

16. (a) Classify the DC Generators according to field excitation.
    (b) A DC Shunt Generator delivers 450 A at 230 V & the resistance of the shunt field, armature are 50 Ω & 0.03 Ω respectively. Calculate the generated EMF.

17. (a) What are the rules for Lap connected & Wave connected armature windings ? Explain with sketches.
    (b) Draw the open circuit characteristics of seperately excited DC generator and explain.

18. (a) Write the causes for failure of voltage build up in DC Shunt Generator.
    (b) Write the applications of DC Series Motor.

19. (a) Write the advantages & disadvantages of armature control over flux control method of speed control.
    (b) Classify DC Motors & write their voltage equations.
