



C14-EE-302

4244

BOARD DIPLOMA EXAMINATION, (C-14)
MARCH/APRIL—2016
DEEE—THIRD SEMESTER EXAMINATION

DC MACHINES

Time : 3 hours]

[Total Marks : 80

PART—A

3×10=30

- Instructions :** (1) Answer **all** questions.
(2) Each question carries **three** marks.
(3) Answer should be brief and straight to the point and shall not exceed *five* simple sentences.

1. State the Fleming's right-hand rule.
2. Define MNA and GNA. 1½+1½=3
3. State the functions of yoke, commutator and pole core in DC generator. 1+1+1=3
4. What is armature reaction? List different effects of it. 1+2=3
5. Derive the e.m.f. equation of a DC generator.
6. Explain the significance of back EMF.
7. Explain power stages in a DC motor.

- * 8. State the factors that affect the speed of a DC motor.
9. State the necessity of 3-point starter.
10. What is the main difference between brake test and Swinburne's test?

PART—B

10×5=50

Instructions : (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

11. Explain the working of simple loop generator.
12. (a) List various losses in a DC generator. 4
- (b) A 4-pole DC generator is delivering 20 A to a load of 10 Ω. If the armature resistance is 50 mΩ, calculate the induced EMF of the machine. Allow a drop of 1 V per brush. 6
13. (a) A 4-pole DC generator has an output of 120 A at 400 V, the wave connected armature has 980 conductors. The brushes are advanced by 3 degrees from the neutral axis. Find (a) AT_d /pole, (b) AT_c /pole. 6
- (b) Write the advantages of parallel operation of DC generator. 4
14. Explain the process of commutation with neat sketch.
15. (a) Derive the torque equation of DC motor. 6
- (b) Determine the torque established by the armature of a 4-pole DC motor having 774 conductors, two paths in parallel, 24 milliWebers of pole flux and the armature current is 50 A. 4
16. (a) Classify DC motors. 4
- (b) Draw the electrical and mechanical characteristics of a DC shunt motor. 6

- * **17.** (a) State the function of No volt coil and overload coil in a 3-point starter. 6
- (b) List the advantages and disadvantages of Wand Leonard methods. 4
- 18.** Explain the method of conducting Swinburne's test with a neat circuit diagram.
