



C14-EE-302

4244

**BOARD DIPLOMA EXAMINATION, (C-14)**  
**OCT/NOV—2016**  
**DEEE—THIRD SEMESTER EXAMINATION**

DC MACHINES

Time : 3 hours ]

[ Total Marks : 80

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**PART—A**

3×10=30

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

1. State the method of producing dynamically induced EMF.
2. State any six parts of DC machine.
3. Draw the power-stage diagram of DC generator.
4. List different methods of improving commutation.
5. State the conditions for building-up of EMF in DC generators.
6. State Fleming's left-hand rule.
7. Define torque in DC motors and write down the units for it. 2+1
8. State three methods of speed control for DC series motors.
9. List any three tests of DC motor.
10. Explain the working of no-volt coil (NVC) in brief.

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**PART—B**

10×5=50

- Instructions :** (1) Answer *any five* questions.  
(2) Each question carries **ten** marks.  
(3) Answers should be comprehensive and the criterion for valuation is the content but not the length of the answer.

- 11.** (a) Derive the EMF equation of DC generator.  
(b) A 4-pole machine running at 1500 rpm has an armature with 90 slots and 6 conductors per slot. The flux per pole is 60 mWb. Determine the induced EMF, if the machines is connected in lap winding.
- 12.** Give the detailed classification of DC generators with neat diagrams and equations of EMF.
- 13.** Explain the commutation with neat diagram.
- 14.** (a) Explain the significance of back EMF. 5  
(b) Derive the equations for (i) armature torque and (ii) shaft torque. 5
- 15.** (a) Draw power flow diagram of DC motor.  
(b) A 6-pole DC shunt motor has a wave-connected armature with 87 slots, each slot containing six conductors. The flux per pole is 30 mWb and the armature has a resistance of 0.10 ohm. Calculate the speed when the motor is connected to a 250 V supply and taking an armature current of 80 A.
- 16.** Draw the neat sketch of three-point starter and explain its working.

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- \* **17.** Explain the method of conducting Swinburne's test.
- 18.** Write short notes on any *two* of the following :
- (a) Interpoles
  - (b) Parallel operation
  - (c) Compensating winding

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