C14–EE–**302**

4244

BOARD DIPLOMA EXAMINATION, (C–14)
OCT/NOV—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) 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.

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.

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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