C16–EE–302

6238

BOARD DIPLOMA EXAMINATION, (C–16)
MARCH/APRIL—2018
DEEE—THIRD SEMESTER EXAMINATION

DC MACHINES AND MEASURING INSTRUMENTS

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 Fleming's left-hand rule.

2. List various losses in DC generator.

3. Define MNA and GNA.

4. List the applications of DC motors.

5. What is the necessity of starter? List different starters used in DC shunt motor.

6. List the methods of motor testing.

7. Write any three disadvantages of moving-coil instruments.

8. What are the applications of CT and PT?

9. What is the purpose of controlling torque in measuring instruments?

10. State any three uses of digital multimeter.

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. Explain the process of commutation of DC generator with neat sketches.

12. *(a)* Derive the condition for maximum efficiency of DC generator.

(b) A 4-pole, 220 V DC long shunt compound generator supplies a load of 10 kW at the rated voltage. The armature, series field and shunt field resistances are 0·2 , 0·25 and 230 respectively. The armature is lap wound with 50 slots, each slot containing 6 conductors. If the flux per pole is 45 MWb, find the speed of the generator.

13. Classify the DC motors and derive the torque equation of a DC motor.

14. *(a)* A 220 volt DC shunt motor has armature and field resistances are 0·7 and 220 respectively. Calculate the back EMF when the motor is taking 3·8 kW as input.

(b) Draw a neat diagram of DC 4-point starter and label the parts.

15. Explain the field control and armature control method of DC shunt motor.

16. Explain the construction and working of 1 induction type energy meter with neat diagram.

17. *(a)* Compare MC and MI instruments in five aspects.

(b) Write the specifications of digital voltmeter.

18. Explain the working of rectifier type voltmeter and ammeter.

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