



**C23-EE-302**

**23135**

**BOARD DIPLOMA EXAMINATION, (C-23)**  
**MARCH/APRIL—2025**  
**DEEE – THIRD SEMESTER EXAMINATION**  
**ELECTRICAL MACHINES – I**

*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. Define armature reaction in a DC generator.
2. State various losses occurred in a DC generator.
3. Classify DC motors based on excitation.
4. List any three applications of DC shunt motor.
5. Define torque and write torque equation of DC motor.
6. List different tests of DC motors.
7. State the need for instrument transformers (CT and PT).
8. State any three advantages of Moving Iron instruments.
9. Classify the transducers based on the principle of transduction.
10. List the basic components of digital instruments.

**PART—B**

10×5=50

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

- 11.** (a) Derive the e.m.f. equation of DC generator. 5  
(b) A six-pole, lap wound DC generator develops an e.m.f. of 400 V at 1000 r.p.m. If the armature has 800 conductors, find the flux per pole. 5
- 12.** Describe the constructional features of a DC generator and write the functions of each part. 10
- 13.** (a) Explain the working of DC motor with a neat sketch. 5  
(b) A 440 V DC shunt motor has armature resistance of 0.8 Ω and shunt field resistance of 200 Ω. Determine the back e.m.f. when the input of the motor is 9 kW. 5
- 14.** Explain the procedure to conduct brake test on DC series motor with a neat connection diagram. 10
- 15.** Explain the working of Permanent Magnet Moving Coil (PMMC) instrument with a neat diagram. 10
- 16.** Explain the working of dynamometer type wattmeter with a neat diagram. 10
- 17.** Explain the construction of Linear Variable Differential Transformer (LVDT) with a neat diagram. 10
- 18.** Explain the working of single-phase digital energy meter with block diagram. 10

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