



C23-EE-302

23135

**BOARD DIPLOMA EXAMINATION, (C-23)
OCTOBER/NOVEMBER—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. State commutation and list different methods of improving commutation.
2. Define armature reaction and state its effects.
3. Write the formula for back EMF for series wound DC motor with equivalent circuit.
4. Define torque and write the formula for torque equation of a DC motor.
5. State the working principle of DC motor.
6. List the methods used to control the speed of DC shunt motor.
7. State the purpose of obtaining damping torque in indicating instruments.
8. State the need of instrument transformers.
9. Define transducer.
10. List any six applications of sensors.

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 6 pole DC shunt generator with 800 wave wound armature conductors supplied a resistive load (R_L) of $15\ \Omega$ at a terminal voltage of 240 V. The armature and shunt field resistances are $0.2\ \Omega$ and $120\ \Omega$ respectively. Determine (i) e.m.f. induced and (ii) the flux per pole when the speed is 400 r.p.m. Allow the brush drop of 1 volt per brush.
- 12.** Explain the working principle of a DC generator.
- 13.** In a long shunt compound DC motor working on 250 V draws a current of 60 A. the armature resistance is $0.04\ \Omega$, series field resistance is $0.02\ \Omega$ and shunt field resistance is $125\ \Omega$. The brush contact drop is 1 V per brush. Calculate the back EMF produced.
- 14.** Explain the working of 3-point starter with a legible sketch.
- 15.** Explain the working of permanent magnet moving coil instrument.
- 16.** Describe the working of attraction type moving iron instrument.
- 17.** Explain the working of LVDT with a neat sketch.
- 18.** Explain the working of digital multimeter with a block diagram.

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