



C23-EE-402

**23436**

**BOARD DIPLOMA EXAMINATION, (C-23)  
OCTOBER/NOVEMBER—2025  
DEEE – FOURTH SEMESTER EXAMINATION  
ELECTRICAL MACHINES—II**

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. Compare squirrel cage rotor with slip ring in any three aspects. 3
2. List any three advantages of 3-phase induction motor. 3
3. The rotor of a 3-phase induction motor with 4 poles is running at 1440 rpm. Calculate (a) slip speed and (b) slip if the supply frequency is 50 Hz. 3
4. Classify single-phase AC motors. 3
5. Define (a) pitch factor and (b) breadth factor related to an alternator. 3
6. State the advantages of stationary stator in an alternator. 3
7. State the need for exciter in an alternator. List various types of exciters. 1+2
8. Write the conditions for operating the alternators in parallel. 3
9. List out the applications of synchronous motors. 3
10. What is synchronous condenser? 3

**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.** List the methods of speed control of an induction motor and explain frequency control method. 6+4
- 12.** State the need for a starter in a 3-phase induction motor. Explain the working of star-delta starter with a legible sketch. 2+8
- 13.** Explain the construction and working principle of single-phase split phase induction motor. Draw its torque-speed characteristics. 4+4+2
- 14.** What is armature reaction? Explain the armature reaction in an alternator at various power factors. 2+8
- 15.** Calculate the line value of induced e m f of a 10 pole, 3-phase, 50 Hz star connected alternator with 60 slots and 4 conductors per slot. The coil span is  $150^\circ$ , flux per pole is 0.12 Wb and it is sinusoidally distributed. 10
- 16.** Two alternators running in parallel supply a lighting load of 2000 kW and a motor load of 4000 kW at a power factor of 0.8 lagging. One machine is loaded at 2400 kW at a power factor of 0.95 lagging. What is the kW output and p.f. of the second machine? 10
- 17.** Compare synchronous motor with induction motor. 10
- 18.** Explain the effects of varying excitation at constant load of a synchronous motor with necessary phaser diagrams. 10

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