



C14-AEI-302

4215

BOARD DIPLOMA EXAMINATION, (C-14)
OCT/NOV—2016
DAEI—THIRD SEMESTER EXAMINATION
ELECTRICAL 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 principle of a DC generator.
2. List the methods of speed control of DC motor.
3. List the applications of a DC series motors.
4. Define transformation ratio.
5. Draw the $-Y$ connection of 3- transformer.
6. State the condition for maximum efficiency of an induction motor.
7. List the losses of an induction motor.
8. Write the e.m.f. equation of an alternator.
9. List the applications of synchronous motor.
10. List the applications of shaded pole motor.

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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.** Derive the e.m.f. equation of DC generator.
- 12.** (a) State the significance of back e.m.f. of a DC motor. 4
(b) Determine the value of torque developed by the armature of a 6-pole wave wound motor having 440 conductors, 30 m Wb/pole when the armature current is 40 A. 6
- 13.** (a) Derive the condition for maximum efficiency of a 1-transformer. 5
(b) A single-phase transformer has 600 primary and 1200 secondary turns. Net cross-sectional area of the core is 500 cm². If the primary winding is connected to 50 Hz supply at 400 V, calculate the maximum flux density and e.m.f. induced in the secondary. 5
- 14.** Explain the principle and working of autotransformer.
- 15.** Explain the constructional details of cage-type and wound-type induction motors.
- 16.** Explain the principle of operation of a single-phase induction motor.
- 17.** Explain the basic principle of working of an alternator.
- 18.** (a) Mention the starting methods of synchronous motor. 4
(b) Explain the principle of operation of stepper motor. 6
