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C14–AEI–302

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BOARD DIPLOMA EXAMINATION, (C–14)

OCT/NOV—2018

DAEIE—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 emf equation of a DC generator.

2. Explain the principle of separately excited generator.

3. List the applications of DC series and shunt motors.

4. Define transformation ratio.

5. Draw the -*Y* connection of 3- transformer.

6. State the relation between rotor frequency and slip.

7. List the losses of an induction motor.

8. Mention the methods of starting synchronous motor.

9. Define voltage regulation of an alternator.

10. List the applications of shaded pole motor.

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. Explain the simple loop generator with necessary diagram and waveforms.

12. *(a)* Explain the significance of back emf of a DC motor. 5

(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. 5

13. *(a)* Derive the condition for maximum efficiency of a transformer. 5

(b) A single-phase transformer has 500 primary and 1000 secondary turns. Net cross-sectional area of the core is 500 cm^2. If the primary winding is connected to 50 Hz supply at 400 V, calculate the maximum flux density and emf induced in the secondary. 5

14. Explain the principle and constructional details of 1-transformer.

15. Explain the principle of operation of a single-phase induction motor.

16. *(a)* List the applications of 3- induction motor. 3

(b) Explain capacitor start-capacitor run single-phase induction motor. 7

17. Explain the basic principle of working of an alternator.

18. *(a)* State the emf equation of an alternator. 3

(b) List the applications of a synchronous motor. 2

(c) Explain the principle of operation of stepper motor. 5

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