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BOARD DIPLOMA EXAMINATION, (C–14)
MARCH/APRIL—2018
DEEE–FOURTH SEMESTER EXAMINATION

AC 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. Draw the vector diagram of an ideal transformer.

2. Define All-Day efficiency of a transformer.

3. Differentiate between distribution and power transformer in any three aspects.

4. Draw the vector diagram of transformer working with unity p.f.

5. Draw the connection diagram of Delta-Star configuration of a three-phase transformer.

6. Write any six cooling methods of a transformer.

7. Write any three advantages of stationary armature over rotating armature.

8. Define Voltage Regulation of an Alternator.

9. Define Coil span and Distribution factor of a Synchronous generator.

10. State the conditions for synchronization of an alternator.

PART—B

10×5=50

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

11. Obtain the equivalent circuits of a single-phase transformer referred to primary side and secondary side.

12. A 50 kVA, 2000/200 V, 50Hz single-phase transformer has an impedance drop of 5% and resistance drop of 3%. Find :

i) Regulation at full load 0.8 p.f. lagging

ii) Power factor at which regulation is zero.

iii) Power factor at which regulation is maximum.

13. A 15 kVA, 400/200 V, 50Hz single-phase transformer gave the following test results:

O.C. test: 400V, 1A,50W (H.V. side).

S.C. test: 12V, 10A, 40W(L.V. side)

Calculate (i) Active and reactive components of no-load current (ii) percentage regulation at full load and 0.8 power factor lagging.

14. A transformer has a maximum efficiency of 98% at 15kVA at UPF. During the day, it is loaded as follows:

10 hours- 3 kW at 0.6 p.f.

5 hours- 10kW at 0.8 p.f.

5 hours- 18kW at 0.9 p.f

4 hours- No load

15. State the function and location of :

(a) Breather

(b) Conservator

(c) Explosion vent

(d) Buchholz relay

16. Explain the steps involved to find the regulation of alternator by synchronous impedance method.

17. A three-phase, 6pole alternator has 144 slots with 4 conductor sper slot, the winding being double layer winding. Flux in the air gap is 50 m Wb sinusoidally distributed. The coil span is 150°(electrical). Find the generated when the alternator shaft is driven at 375 rpm.

18. Explain the procedure of synchronization of alternators using Dark lamp and Bright lamp method.

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