



C14-EE-402

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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.

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- 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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