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BOARD DIPLOMA EXAMINATION
JUNE - 2019
DIPLOMA IN ELECTRICAL AND ELECTRONICS ENGINEERING
A.C. MACHINES -I
FOURTH SEMESTER EXAMINATION

Time: 3 Hours   **Total Marks: 80**

PART - A   (3m x 10 = 30m)

Note 1:Answer all questions and each question carries 3 marks

2:Answers should be brief and straight to the point and shall not exceed 5 simple sentences

1. Draw the vector diagram of single phase transformer on No-Load

2. State the necessity of parallel operation of transformers

3. Compare core type transformer and shell type transformer in any three aspects

4. A 50 KVA transformer has on full load a copper loss of 600W and iron loss of 500W .Find the load KVA corresponding to maximum efficiency

5. State the function of following parts of 3-phase power transformer
       (a) Buchholz relay   (b) Silica gel

6. State the applications of (i) delta-delta (ii) delta –star coneected 3– phase transformers

7. List the various types of exciters in an alternator

8. State the reasons for voltage variations of an alternator on load

9. State any three advantages of short pitched coils in case of an alternator

10. State the necessity for parallel operation of alternators

Note 1:Answer any five questions and each carries 10 marks

   2:The answers should be comprehensive and the criteria for valuation is the content but not the length of the answer

11. A 40 KVA,2000/400 V, 50 Hz single phase transformer has a primary resistance and reactance of 5 Ω and 12 Ω respectively. The secondary resistance and reactance are 0.2 Ω and 0.48 Ω respectively. Calculate
(i) equivalent resistance referred to both primary and secondary
(ii) equivalent reactance referred to both primary and secondary
(iii) equivalent impedance referred to both primary and secondary

12. A 100 KVA ,11 KV/ 400 V,50 Hz,1-phase transformer has 110 turns on the secondary side.Calculate (i) the approximate values of the primary and secondary full-load currents (ii) the maximum value of flux in the core and (iii) the no of primary turns

13. A 5 KVA, single phase transformer has a core loss of 40 W and full- load Copper loss of 100 W. During the day, the transformer is loaded as under.

    7 A.M to 1 P.M: 3 KW at 0.6 p.f.lagging

    1 P.M to 6 P.M: 2 KW at 0.8 p.f.lagging

    6 P.M to 1 A.M: 6 KW at 0.9 p.f.lagging

    1 A.M to 7 A.M: No-load.

    Determine the all day efficiency of the transformer

14. Explain O.C test and S.C test on transformer with a neat diagram.

15. a) State any five advantages of 3–phase transformer over 1–phase transformer
   b) Derive an expression for saving of copper in auto transformer.

16. In a 50 KVA ,star connected, 440 V, 3 phase, 50 Hz alternator, the effective armature resistance is 0.25Ω per phase. The synchronous reactance is 3.2 Ω/phase and the leakage reactance is 0.5Ω/phase. Determine at rated load and unity p.f. (i) internal e.m.f. E_a (ii) no-load e.m.f E_0 and (iii) percentage regulation on full load

17. A 16 pole, 3-phase, 144 slot alternator has 10 conductors per slot with star- connected armature winding. The air gap is sinusoidally distributed having a flux of 0.03 wb/pole. If alternator runs at 375 r.p.m. Calculate (i) The phase voltage and (ii) the line voltage generated. Assume full pitch winding

18. Explain the procedure of synchronization of alternators by using dark and bright lamp method with a neat sketch

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