



C14-EE-402

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**BOARD DIPLOMA EXAMINATION, (C-14)
OCTOBER/NOVEMBER-2018
DEEE-FOURTH SEMESTER EXAMINATION**

A.C.MACHINES-I

Time : 3 Hours]

[Total Marks: 80

PART-A

3X10=30

- Instructions :**
1. Answer **All** questions.
 2. Each question carries **THREE** marks
 3. Answer should be brief and straight to the point

1. Give the classification of transformers based on their function.
2. Define regulation of a single phase transformer.
3. Write the comparison between core type and shell type single phase transformer in any 3 aspects.
4. A 5 KVA 200/400 V transformer has 80 W copper loss at 20 A current. Calculate the copper losses at 25 Amps current.
5. Draw the connection diagram of 3-phase star-delta transformer.
6. List any 3 applications of Auto transformer.
7. Define the chording factor of an alternator.
8. List the various types of exciters in an alternator.
9. Write the comparison between salient pole type and non-salient pole type rotors of an alternator.
10. What are the conditions to be satisfied for parallel operation of alternator.

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Contd..,

PART-B

10X5=50

Instructions *

1. Answer any **five** questions. Each question carries **ten** marks.
2. Answer should be comprehensive and the criterion for valuation is the content but not the length of the answer

11. (a) Explain the working of a single phase transformer.
(b) Explain the function of the following parts of the transformer (i) Conservator (ii) Breather (iii) Buchholz relay.
12. (a) Derive the condition for maximum efficiency of a single phase transformer.
(b) The no load current of a transformer is 15A at a P.F of 0.2 when connected to a 460 V, 50 Hz supply. Estimate the iron loss and magnetising component of the current.
13. (a) State the need for parallel operation of single phase transformers.
(b) A transformer has its maximum efficiency of 0.98 at 15 KVA and UPF. During a day it is loaded as follows.

Hours	Load in KW	Power Factor
12 Hrs	2 KW	0.5
6 Hrs	12 KW	0.8
6 Hrs	18 KW	0.9

Find the all-day efficiency of the transformer.

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14. (a) Explain why S.C test conducted always on H.V side of a transformer.
(b) The maximum efficiency of 100 KVA, 6600/ 250V, 50 Hz, single phase transformer occurs at half load and is 98% UPF. Calculate the F.L efficiency at 0.8 PF lagging.
15. (a) State the advantages 3 phase transformer over single phase transformer.
(b) Show that an auto transformer required less copper than an ordinary two winding transformer?

16. (a) Explain with legible sketch the effect of armature reaction in 3 phase alternator at different power factors.
- (b) A 100KVA, 3000V, 50 Hz, 3-phase star connected alternator has effective armature resistance of 0.2Ω . A field current of 4A produces a short-circuit of 200A and open-circuit e.m.f of 1040 V(between lines). Calculate the percentage regulation at full-load 0.8 P.F. leading.
17. (a) Explain the working principle of an alternator.
- (b) Find the line value of induced e.m.f of 4 pole 50 Hz, star connected a.c generator from the following data. Flux per pole 0.12 Wb, conductors per slot 4 two layer winding coil span 150° . Number of slots per pole phase is 4.
18. (a) What will be the effect of change in excitation to an alternator connected in parallel.
- (b) Two exactly similar 20 MW alternators operate in parallel. The speed-load characteristics of the driving turbines are such that the frequency of alternator A drops uniformly from 50 Hz on no-load to 48 Hz on full load and that of alternator B from 50 Hz to 48.5 Hz. How will the two alternators share a load of 30000 KW.

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