



C16-EE-401

6440

BOARD DIPLOMA EXAMINATION, (C-16)

JANUARY/FEBRUARY—2022

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. Explain why transformer is not connected to DC supply.
2. Write any three differences between ideal transformer and practical transformer.
3. Explain why transformer is rated in KVA.
4. Define all day efficiency of a transformer.
5. What is the necessity of tap changer in transformers?
6. Draw the connection diagram of star-delta configuration of a 3-phase transformer.
7. Define pitch factor and distribution factor.
8. What are the advantages of stationary armature in an alternator?
9. List the methods for determining voltage regulation of an alternator.
10. Explain about the necessity of parallel operation of alternators.

*

PART—B

10×5=50

Instructions : (1) Answer *any five* questions.

(2) Each question carries **ten** marks.

(3) Answers should be comprehensive and criterion for valuation is the content but not the length of the answer.

- 11.** A 75 kVA 5000/250 V 1-phase transformer has $R_1 = 3.45 \Omega$, $X_1 = 5.2 \Omega$, $R_2 = 0.009 \Omega$, $X_2 = 0.015 \Omega$. Calculate (a) total resistance and total reactance referred to primary side, (b) total resistance and total reactance referred to secondary side, (c) total impedance referred to primary side and (d) total impedance referred to secondary side.
- 12.** Explain about the classification of transformers in detail.
- 13.** A 40 kVA, 4000/400 V 1-phase transformer has full load efficiency of 94%. If the maximum efficiency occurs at 90% of full load, find the iron loss and full load copper loss of the transformer at 0.8 pf lagging.
- 14.** (a) Explain about the various losses occurring in a transformer. 5
(b) Obtain approximate equivalent circuit of a transformer. 5
- 15.** Explain about the various cooling methods of a transformer.
- 16.** Explain in detail about the construction of an alternator.
- 17.** (a) Derive the e.m.f. equation of an alternator. 6
(b) An alternator has 9 slots per pole and coil span is 8 slots. Calculate the pitch factor. 4
- * **18.** Explain about the synchronization of 3-phase alternator by two bright lamps and one dark lamp method.

★ ★ ★

*