

B.TECH SEM – IV (2007 COURSE) (ELECTRICAL ENGG.) :

SUMMER - 2018

SUBJECT : TRANSFORMER THEORY AND DESIGN

Day : **Tuesday**
Date : **05/06/2018**

S-2018-2616

Time : **10.00 AM TO 01.00 PM**
Max. Marks : **80**

N. B. :

- 1) **Q. No.1 and Q. No.5 are COMPULSORY.** Out of the remaining attempt **ANY TWO** questions from each section.
- 2) Figures to the right indicate **FULL** marks.
- 3) Answers to both the sections should be written in **SEPARATE** answer books.
- 4) Use of non-programmable calculator is **ALLOWED**.

SECTION - I

- Q.1**
- a) Derive the Emf equation of single phase transformer. **(05)**
 - b) Explain the concept of floating neutral. **(05)**
 - c) Mention the IS specification of three phase transformer. **(04)**
- Q.2**
- a) Explain with neat sketch working of single phase transformer. **(06)**
 - b) Explain the O.C. test and S.C. test of single phase transformer. State the purpose of test. **(07)**
- Q.3**
- a) Compare three phase transformer with single phase transformer **(06)**
 - b) Explain the conditions of parallel operation three phase transformer **(07)**
- Q.4**
- a) Draw and explain the Sumpner's test. State the purpose of this test. **(07)**
 - b) Explain the concept of **(06)**
 - i) Additive polarity
 - ii) Subtractive polarity with neat sketch.

SECTION – II

- Q.5**
- a) Explain the term stacking factor related with design of the core. **(05)**
 - b) Explain the effect of leakage reactance on the transformer. **(05)**
 - c) Explain the difference between single layer and double layer winding. **(04)**
- Q.6**
- a) Explain the concept of stepped core. Draw diagram of i) 2-stepped core **(07)**
ii) 3- stepped core.
 - b) State importance of flux density in designing the core area. Mention different values of flux density for distribution transformer. **(06)**
- Q.7**
- a) State the assumption made during leakage flux calculation. **(07)**
 - b) Draw mechanical forces i) Radial forces. Ii) Axial forces. **(06)**
Compare both the mechanical forces.
- Q.8**
- a) Give the layout of AC wave winding for the rotor of three phases, four pole induction motor having 24 slots. Each slot contains 2 coil sides. **(07)**
 - b) Explain the difference between integral and fractional slot winding. **(06)**

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