



K. K. Wagh Institute of Engineering Education & Research, Nashik
(An Autonomous Institute From A.Y. 2022-23)

InSem Examination-I Winter2024	
Exam Seat No.:	
Academic Year:2024-2025	Semester: III
Class: SY	Program: B.Tech
Branch Code: ELE	Pattern:2023
Name of Course: Transformers and Induction Machines	Course Code:2306203
Max. Marks:30	Duration:1.15 Hrs.

Instructions: Candidates should read carefully the instructions printed on the Question Paper and on the cover page of the Answer Book, which is provided for their use.

1. This question paper contains 02 page(s).
2. Answer to each new question is to be started on a new page.
3. Assume suitable data wherever required, but justify it.
4. Draw the neat labelled diagrams, wherever necessary.
5. Q.1 and Q.3 are compulsory.

Marks CO

Question No. 1

- 1 a) Explain the working principle of a single-phase transformer. And discuss why transformer is called as constant flux machine? (7) CO1

Question No. 2

- 2 a) A single phase 1kVA transformer working at unity power factor has an efficiency of 90 percent at both full and half load. Calculate the efficiency of transformer at 70 percent of full load unity power factor. (8) CO4

OR

- 2 b) A 20kVA 2000/500V, 50Hz single phase transformer has $R_1=4\text{ohm}$, $R_2=0.3\text{ohm}$, $X_1=6\text{ohm}$ and $X_2=0.4\text{ohm}$. Find the approximate value of voltage regulation at full load 0.8 lagging p.f. and 0.8 leading p.f.. (8) CO4

Question No. 3

- 3 a) Explain the Scott connection of transformer with diagram, phasor, advantages, disadvantages and applications. (7) CO1

Question No. 4

- 4 a) A 3 phase step down transformer is connected to 3.3kV supply and draws a current of 9 A. Calculate the secondary line voltage, line current and output for the following connections: (8) CO3

i) Delta –Star

ii) Star – delta

Turns ratio is 8. Neglect losses

OR

4 b) Open circuit test:

(8) CO3

Given: Rated Primary voltage-230V, Power input-40W, Input current-0.5A

Short circuit test:

Given: Primary voltage-15V, Power input-120W, Input current-10A

Find: i) core loss,

ii) magnetizing reactance and core resistance referred to the primary side

iii) equivalent resistance & reactance referred to primary side

..... **End of question paper**.....