

Unit-4

Equivalent circuit - losses and efficiency

S.No	Questions	BT	CO	PO
Part -A (Short Answer Questions)				
1.	Define voltage regulation of a transformer.	BT1	CO4	PO1
2.	What is the condition for maximum efficiency of a transformer?	BT1	CO4	PO1
3.	Define all-day efficiency.	BT1	CO4	PO1
4.	State any two transformer losses.	BT1	CO4	PO1
5.	Why is the Open Circuit (OC) test conducted on the LV side of a transformer?	BT1	CO4	PO1
6.	Why is the Short Circuit (SC) test conducted on the HV side of a transformer?	BT1	CO4	PO1
7.	What is Sumpner's Test?	BT1	CO4	PO1
8.	Which transformer loss is measured in the Open Circuit test?	BT1	CO4	PO1
9.	Which transformer loss is measured in the Short Circuit test?	BT1	CO4	PO1
10.	Write the equation for hysteresis loss in a transformer.	BT1	CO4	PO1
11.	What is the effect of increasing supply frequency on eddy current loss (assuming flux density remains constant)?	BT1	CO4	PO1
12.	Why is all-day efficiency preferred over ordinary efficiency for distribution transformers?	BT1	CO4	PO1

S.No	Questions	BT	CO	PO
Part -B (Long Answer Questions)				
1.	Draw the exact equivalent circuit of a single-phase transformer and derive the approximate equivalent circuit referred to the primary side.	BT2	CO4	PO2

2.	A 8 KVA, single phase transformer has a turns ratio of 8:3 and is supplied from a 2.0 KV supply. Neglecting Losses, determine (i) Primary current (ii) The full load secondary current (iii) The secondary Voltage	BT3	CO4	PO2
3.	Define all day efficiency? Derive the expression	BT2	CO4	PO2
4.	The percentage resistance and percentage leakage reactance of a 5 kVA, 500 V/ 1000 V, 50 Hz., single phase transformer are respectively 3% and 4%. Calculate the voltage to be applied to the HV side to carry out short circuit test at rated current and also calculate the voltage to be applied to the LV side to carry out short circuit test at half the rated current	BT3	CO4	PO2
5.	A 5KVA, 1000/200 V, 50 Hz single phase transformer gave the following test results: Open circuit test (LV side): 200 V, 1.2 A, 90 W Short circuit test (HV side): 50 V, 5 A, 110 W. Compute the parameters of approximate equivalent circuit referred to LV side.	BT3	CO4	PO3
6.	What is voltage regulation of a transformer? Derive the conditions for maximum and zero voltage regulation in a transformer.	BT3	CO4	PO3
7.	A 40 KVA single phase transformer has got maximum efficiency of 97 % at 80 % of full load at UPF. During the day, the load on the transformer is as follows. No. of hours Load Power factor 9 6 KW 0.6 lag 8 25 KW 0.8 lag 7 30 KW 0.9 lag Determine the All-day efficiency of the transformer	BT3	CO4	PO3

8.	Explain the effect of variation of supply frequency on hysteresis and eddy current losses in a transformer.	BT3	CO4	PO3
9.	Using OC and SC test results, explain the method of predetermining transformer performance.	BT3	CO4	PO3
10.	Explain Sumpner's Test (Back-to-Back Test) with a neat circuit diagram. Mention its advantages and application	BT2	CO4	PO2
11.	Draw the exact equivalent circuit of a transformer and derive the equivalent circuits referred to primary and secondary. Describe the various parameters involved in it.	BT2	CO4	PO2