1. A 50KVA 50Hz, transformer has 500 turns on P.W and 100 turns on S.W. the P.W is supplied by 3000V,50Hz AC voltage with full load connected on secondary side, Calculate i) emf induced in secondary winding ii) primary and secondary winding current iii) maximum flux in the core.

Ans : 600V, 83.33A, 16.667A, 0.027Wb

1. The emf per turn of a single-phase 2200/220 V, 50 Hz transformer is approximately 12 V. Calculate (a) the number of primary and secondary turns, and (b) the net cross-sectional area of core for a maximum flux density of 1.5 T.

Ans: 183 turns, 18 turns, 0.036 m

1. A 100 kVA, 1100/230 V, 50 Hz transformer has an HV winding resistance of 0.1 W and a leakage reactance of 0.4 W. The LV winding has a resistance of 0.006 W and a leakage reactance of 0.01 W. Find the equivalent winding resistance, reactance and impedance referred to the HV and LV sides.

Ans: (0.237 + j 0.629) ohm, (0.0104 + j 0.0275) ohm

1. A 600 KVA, single phase transformer has an efficiency of 92% at both full load and half load at unity p.f.. Determine its efficiency at 60% of full load and 0.8 p.f. lag.

Ans: 90.59%

1. A 11000/230 V, 150 KVA, 50Hz single phase transformer has a core loss 1.4kW and full load copper loss of 1.6 kW. Determine i) the KVA load for maximum efficiency and the maximum efficiency. ii) The efficiency at half load and full load at 0.8 p.f lagging.

Ans: 160KVA, 98.2%, 97%

1. A 50 KVA, 2200/110 transformer when tested gave following results:

OC tests: 400W 10A 110V

Sc tests: 808W 20.5A 90V

Compute all the parameters of the transformer referred to both high voltage and low voltage side.

Ans: 30.55, 11.8, 12220, 4720, 1.922, 4.39, 3.946, 0.0048, 0.009863 ohm

1. The primary and secondary winding of a 30KVA, 6000/230V transformer have resistance of 10 ohm and 0.016ohm respectively. The total reactance of the transformer referred to primary is 23 ohm. Calculate the percentage regulation of the transformer when supplying the full load current at a PF of 0.8 lagging.

Ans: 2.543%

1. The following test results were obtained for a 20 k VA, 50 Hz, 2400/240 V distribution transformer. OC test (LV) = 240 V, 1.066 A, 126.6 W; SC test (HV): 57.5 V, 8.34 A, 284 W. (a) When the transformer is operated as a step-down transformer with the output voltage equal to 240 V, supplying a load at upf,

a) Determine the maximum efficiency and the upf load at which it occurs.

(b) Determine the pf of the rated load, supplied at 240 V, such that the terminal voltage observed on reducing the load to zero is still 240 V.

Ans: 13.37 kVA ,98.14 percent, 0.805 leading

1. In a 25 kVA, 2000/200 V transformer, the iron and copper losses are 350 and 400 W respectively. (a) Calculate the efficiency on upf at (i) full load (ii) half load. (b) Determine the load for maximum efficiency and the iron and the copper loss in this case.

Ans: 97.08%, 96.5%, 23.385 KVA, 350 Watt, 350 Watt

1. The efficiency of a 1000 kVA, 110/220 V, 50 Hz, single-phase transformer is 98.5% at half full-load at 0.8 pf leading and 98.8% at full-load upf. Determine: (a) iron loss, (b) full-load copper loss and (c) maximum efficiency at upf. Ans: 4071W, 8079W, 98.9%
2. A transformer has its maximum efficiency of 0.98 at 20 kVA at upf. During the day it is loaded as follows:

12 hours: 2 kW at pf 0.6

6 hours: 10 kW at pf 0.8

6 hours: 20 kW at pf 0.9

Find the ‘all day’ efficiency of the transformer.

Ans: 96.77%