Quiz on AC Transformers

Name: Roll no: Code : VEDFFYHYJO

1. An ideal transformer has a turns ratio of 13:125. The
   following connections are made:
   Primary side: Voltage of 210 V is applied
   Secondary side: a resistance of 10 kΩ is connected.
   What is the input power taken by the primary side?

   A. 42 W

   B. 432 W

   C. 371 W

   D. 408 W

2. A 320 KVA, 1250/500 V transformer has primary re-
   sistance and secondary resistance of 0.042 Ω and 0.026
   Ω. Calculate the copper loss of the transformer, when
   supplying (4/7)th fraction of full rated load.

   A. 13402 W

   B. 4376 W

   C. data not sufficient

   D. 988 W

3. The percentage resistance and reactance of a trans-
   former are 1% and 5% respectively. The approximate
   regulation on full load at 0.8 pf lag is

   A. 3.80 %

   B. -2.20 %

   C. 1.80 %

   D. -0.20 %

4. Single-phase transformer has hysteresis loss of 170 W
   and eddy current loss of 70 W at 41 Hz operation. Its
   core losses at 58 Hz operation will be

A. 380.57 W

B. 761.14 W

C. 240.49 W

D. 140.08 W

EMF Equation of Transformer

A 20 KVA transformer has 380 turns in the primary
and 40 turns in the secondary. The primary is con-
nected to 2570 V, 50Hz supply. Neglect losses, leak-
age drops and no load current in the primary. Based
on this data solve following three questions.

Hint: Refer to the video at this QR code
to solve this set of questions.

5. Find the full load secondary current?

   A. 73.93 A

   B. 0.07 A

   C. 36.96 A

   D. 7.78 A

6. What is the emf induced in the secondary?

   A. 284.05 V

   B. 135.26 V

   C. 242.05 V

   D. 270.53 V

7. What is maximum flux in the core?

   A. 69.46 mWb

   B. 30.46 mWb

   C. 29.55 mWb

   D. 107.08 mWb

8. A 5 kVA, 400/80V transformer Req(HV)=0.9 Ω and Xeq(HV) = 4Ω and a lagging load is being supplied by it resulting in the following meter readings (meters are placed on the HV side): $I_1 = 26A$, $V_1 = 500V$, P_1 = 4 kW For this condition calculate what a voltmeter would read if connected across the load terminals. Assume the exciting current to be zero.

   A. 237.695 V

   B. 118.847 V

   C. 475.390 V

   D. 356.542 V

9. A 18 kVA transformer has iron losses of 330 W. When supplying a load of 8 KW at a power factor of 0.75 lag, the transformer efficiency was 92.93 %. Determine the full load copper losses of the transformer.

   A. 793.44 W

   B. None of these choices

   C. 608.63 W

   D. 278.63 W

OC and SC Test on a Transformer

A 200/380 V, 50 Hz transformer when tested gave the following results:
OC test, measurement on LV side:
50 W, 0.7 A, 200 V
SC test, measurement on HV side:
98 W, 8 A, 16 V
Based on the above data determine all the parameters of the equivalent circuit of the transformer and accordingly answer the following four questions.

Hint: Refer to the video at this QR code to solve this set of questions.

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10. Determine equivalent resistance of the transformer in Ω referred to the LV side.

   A. 1.531

   B. 800

   C. 0.424

   D. 0.356

11. Determine the magnetizing reactance of the transformer referring to the LV side.

   A. 0.356

   B. 800

   C. 1.287

   D. 306

12. Determine equivalent reactance of the transformer in Ω referred to the HV side.

   A. 1.531

   B. 306

   C. 1.287

   D. 0.356

13. Determine the resistance representing the core losses of the transformer referring to the LV side.

   A. 0.424

   B. 800

   C. 1.531

   D. 306

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14. An ideal transformer has a primary winding of 1400 turns. On the secondary side the number of turns between A and B is 360 and between B and C is 640 turns, that between A and C being 1000. The transformer supplies a resistor connected between A and C which draws 19 kW. Further, a load of 800 Ω is connected between A and B. The primary voltage is 2 kV. Find the primary current.

   A. 9.665 A

   B. 76.000 A

   C. 57.000 A

   D. 19.331 A

15. A 200/90 V transformer has an iron loss of 430W when excited from high voltage side under no load condition. If the no load current is 3A, then the no load power factor is

   A. 0.53

   B. 0.24

   C. 0.72

   D. 1.59

16. Which side of the transformer should the meters be connected for performing the OC test and SC Test, respectively?

    A. Primary, Secondary

    B. Secondary, Primary

    C. Secondary, Secondary

    D. Primary, Primary

17. What is the input power taken from the supply during the OC test?

    A. 23.5 W

    B. 11.9 W

    C. 62.2 W

    D. 325.0 W

18. What is the input power taken from the supply during the SC test?

    A. 23.5 W

    B. 325.0 W

    C. 122.7 W

    D. 4.5 W

19. What is supply voltage to be applied during the SC test?

    A. 0 V

    B. 480 V

    C. 210 V

    D. 4.1 V

20. What is current taken from the supply during the OC test?

    A. 9.792 A

    B. 1.547 A

    C. 0.618 A

    D. 2.835 A

21. An ideal transformer has a turns ratio of 3:6. A Resistance of 450 Ω is connected across the secondary terminals. An Ohm meter is connected across the primary terminals. What is the value of measured resistance ?

    A. 0.25 Ω

    B. 112.50 Ω

    C. 225.00 Ω

    D. 37.50 Ω

22. The pu impedance of generator is 0.4 pu on the base values of 10 kV, 50 MVA. If the base values are 21 kV, 136 MVA then the same impedance in pu is ?

    A. 0.5181 pu

    B. 3.2467 pu

    C. 0.2467 pu

    D. 0.4934 pu

23. The open-circuit test result gives 200 V, 79 A, 5kW on low-voltage side of a transformer, whose rating is 80 kVA, 1000/200 V, 55 Hz and single-phase with 1000 turns on high-voltage side. The core loss component of current is approximately.

    A. 40.00 A

    B. 12.50 A

    C. 0.03 A

    D. 25.00 A

24. The full load copper losses and iron loss of a 38 KVA transformer are 1125 W and 732 W respectively. Determine the efficiency of the transformer when supplying half-load at unity power factor?

    A. 97.40 %

B. 95.34 %

C. 94.94 %

D. 93.62 %

25. The full-load copper loss of a transformer is 1520 W. At half-load, the copper loss will be

A. 1520 W

B. 190 W

C. 760 W

D. 380 W

* * * All the Best * * *

Scan / click the QR code to submit your answers.