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1- What is Transformer?

a. Transformer is a device used to convert low alternating voltage to a high alternating voltage.

b. Transformer is a device used to convert alternating current to direct current.

c. Transformer is a device used to convert low alternating current to a high alternating current.

d. Transformers are used only for low alternating voltage.

2- What is the function of a transformer?

a. Transformer is used to step down or up the AC voltages and currents.

b. Transformer is used to step down or up the DC voltages and currents.

c. Transformer converts DC to AC voltages.

d. Transformer converts AC to DC voltage.

3- Transformer core is generally made of _____

a. Cannot be determined.

b. Can be made with any of the above method.

c. By stacking large number of sheets together.

d. Single block of core material.

4- Which type of flux does transformer action need?

a. Alternating electric flux.

b. Alternating magnetic flux.

c. Increasing magnetic flux.

d. Constant magnetic flux.

5- Primary winding of a transformer _____

a. Could either be a low voltage or high voltage winding.

b. Is always a high voltage winding.

c. Cannot be determined.

d. Is always a low voltage winding.

6- For a transformer with primary turns 100, secondary turns 400, if 200 V is applied at primary we will get _____

a. 3200 V at secondary.

b. 1600 V at secondary.

c. 800 V at secondary.

d. 80 V at secondary.

7- A transformer cannot work on the DC supply because _____

a. There is no need to change the DC voltage.

b. A DC circuit has more losses.

c. Faraday's laws of electromagnetic induction are not valid since the rate of change of flux is zero.

d. Cannot be determined.

8- In a transformer the resistance between its primary and secondary is _____

a. Zero.

b. Very small.

c. Cannot be predicted.

d. Infinite.

9- Identify the correct statement relating to the ideal transformer.

a. No losses and magnetic leakage.

b. Interleaved primary and secondary windings.

c. A common core for its primary and secondary windings.

d. Core of stainless steel and winding of pure copper metal.

10- Turns ratio of the transformer is directly proportional to

_____

a. Resistance ratio.

b. Currents ratio.

c. Voltage ratio.

d. Not proportional to any terms.

11- Which of the following statement is correct regarding turns ratio?

a. Current ratio and turns ratio are inverse of each other.

b. Current ratio is exactly same to the voltage ratio.

c. Currents ratio is exactly same to the turns ratio.

d. Voltage ratio and turns ratio are inverse of each other.

12- Maximum value of flux established in a transformer on load is equal to

_____

a. E1/ (4.44*f*N_1).

b. E1/ (4.44*f*N_2).

c. E2/ (4.44*f*N_1).

d. Cannot define.

13- Which winding in a transformer has a greater number of turns

a. Constant voltage winding.

b. Low voltage winding.

c. Secondary winding.

d. High voltage winding.

14- The magnetic flux is measured in _____.

a. Weber .

b. weber/m^2.

c. m^2/weber.

d. weber/m^3.

15- Magnetic flux density is _____.

a. Flux per unit area.

b. Flux per meter length.

c. Unit area per flux.

d. Meter length per flux.

16- According to _____ induced emf is equal to rate of change of magnetic flux.

a. Newton's law.

b. Lenz law.

c. Faraday's law.

d. Coulomb's law.

17- Which of the following does not change in an ordinary transformer _____?

a. Frequency.

b. Voltage.

c. Current.

d. Any of the above.

Answers:- 1-a, 2-a, 3-c, 4-b, 5-a, 6-c, 7-c, 8-c, 9-a, 10-c, 11-a, 12-a, 13-d, 14-a, 15-a, 16-c, 17-a

Problems

1- A transformer has 500 turns on its primary winding (N_1) and 100 turns on the secondary (N_2). The maximum value of the flux in the core is 2.16 milliweber and the frequency is 50 Hz. Calculate the voltage induced in the:

a. E_1 .

b. E_2.

Ans:- (E_1=239.8 V, E_2= 47.9 V)

2- A transformer has 960 turns on its primary winding (N_1) and 48 turns on the secondary (N_2). Calculate the:

a. turns ratio of the transformer.

b. secondary voltage when 230 V is applied to the primary.

Ans:- (turns ratio 20:1, V_2 = 11.5 V)

3- The primary and secondary of a 25 kVA transformer has 500 and 40 turns, respectively. If the primary is connected to 3000 V, 50 Hz Neglect magnetic leakage, resistance of the winding and the primary no-load current in relation to the full load current, calculate

a. primary and secondary currents at full load.
b. The secondary emf .
c. The maximum flux in the core.

Ans:- (I_1= 8·33 A, I_2= 104.15 A, , E_2= 240 V , ϕ_m= 27 mWb)

4- The emf per turn of an 11 kV /415 V, 50 Hz single-phase core type transformer is 15 V. The maximum flux density in the core is 1.5 T. Find number of primary and secondary turns and net cross sectional area of core.

Ans:- (N_1= 733.33 , N_2= 27.67, A= 450.45 cm^2)

5- A 100 kVA, 3300/200 volt, 50 Hz single phase transformer has 40 turns on the secondary, calculate:

a. The values of primary and secondary currents.
b. The number of primary turns.
c. The maximum value of the flux.

Ans:- (I_1= 30.3 A , I_2= 500 A, N_1= 660, ϕ_m= 0.0225 Wb)