Standard Questions

Transformer

1. What is the primary function of a transformer?
   (a) To convert AC to DC
   (b) To convert DC to AC
   (c) To increase or decrease AC voltage
   (d) To store electrical energy
2. What device is used to change the voltage in a transformer?
   (a) Capacitor (b) Diode
   (c) Transformer (d) Resistor
3. In an ideal transformer, which of the following remains constant?
   (a) Voltage (b) Current
   (c) Power (d) None of the above
4. What is the main difference between an autotransformer and a conventional transformer?
   (a) Autotransformers have only one winding*
   (b) Conventional transformers have only one winding
   (c) Autotransformers are used for AC, conventional for DC
   (d) Conventional transformers are smaller in size
5. Which of the following is not a type of transformer core?
   (a) Iron core (b) Ferrite core
   (c) Copper core (d) Air core
6. The efficiency of an ideal transformer is: 0%
   (a) 0% (b) 50%
   (c) 100% (d) Depends on the load
7. In a step-up transformer, the number of turns in the primary coil is _____ the number of turns in the secondary coil.
   (a) Greater than (b) Less than
   (c) Equal to (d) Unrelated to
8. What happens to the current in a step-up transformer compared to the input current?
   (a) Increases
   (b) Decreases
   (c) Remains the same
   (d) Depends on the load
9. In a step-down transformer, the voltage across the secondary coil is _____ the voltage across the primary coil.
   (a) Greater than (b) Less than
   (c) Equal to (d) Unrelated to
10. The function of the transformer core is to:
    (a) Increase voltage
    (b) Decrease voltage
    (c) Increase magnetic field
    (d) Decrease magnetic field
11. Which of the following materials is commonly used as a core material in transformers?
    (a) Aluminum (b) Copper
    (c) Silicon steel (d) Silver
12. The phenomenon of self-induction is associated with:
    (a) Transformers (b) Capacitors
    (c) Inductors (d) Resistors
13. Which of lthe following equations represents the voltage transformation ratio of a transformer?
    (a) $Vp/Vs = Np/Ns$
    (b) $Vs/Vp = Np/Ns$
    (c) $Vp \times Vs = Np \times Ns$
    (d) $Vp – Vs = Np - Ns$
14. In a transformer, the power output is:
    (a) Always less than the power input
    (b) Always greater than the power input
    (c) Equal to the power input
    (d) Sometimes greater and sometimes less than the power input
15. Which of the following factors does not affect the efficiency of a transformer?
    (a) Core material
    (b) Operating frequency
    (c) Ambient temperature
    (d) Length of the connecting wires
16. What type of loss in a transformer is reduced by using a laminated core?
    (a) Copper loss
    (b) Eddy current loss
    (c) Hysteresis loss
    (d) Flux leakage

17. Which component of a transformer is primarily responsible for energy transfer between circuits?
    (a) Core (b) Windings
    (c) Insulation (d) Cooling system
18. How is the efficiency of a transformer generally expressed?
    (a) Ratio of input power to output power
    (b) Ratio of output power to input power
    (c) Difference between input and output power
    (d) Sum of input and output power
19. What is the main reason for using oil in a transformer?
    (a) To insulate the windings
    (b) To cool the transformer
    (c) To increase the voltage
    (d) To decrease the current
20. What does the turns ratio of a transformer determine?
    (a) The frequency of the output voltage
    (b) The power of the output voltage
    (c) The voltage changes between primary and secondary coils
    (d) The current change between primary and secondary coils
21. In a transformer, what is the purpose of the laminated core?
    (a) To increase the magnetic field strength
    (b) To reduce copper losses
    (c) To improve insulation
    (d) To reduce eddy current losses
22. Which of the following statements is true about a step-down transformer?
    (a) The secondary voltage is higher than the primary voltage
    (b) The secondary current is lower than the primary current
    (c) The secondary voltage is lower than the primary voltage
    (d) The number of turns in the secondary coil is more than in the primary coil
23. What kind of transformer is used to measure high voltages?
    (a) Power transformer
    (b) Autotransformer
    (c) Potential transformer
    (d) Current transformer
24. What kind of transformer is used to measure high currents?
    (a) Power transformer
    (b) Autotransformer
    (c) Potential transformer
    (d) Current transformer
25. In an ideal transformer, if the primary winding has 100 turns and the secondary winding has 200 turns, what is the voltage ratio (Vp:Vs)?
    (a) 2:1 (b) 1:2
    (c) 1:1 (d) 2:3
26. If the primary coil has 1000 turns and the secondary coil has 100 turns, the transformer is:
    (a) Step-up (b) Step-down
    (c) Isolating (d) Inverting
27. The primary principle on which a transformer operates is:
    (a) Ohm's Law
    (b) Coulomb's Law
    (c) Mutual Induction
    (d) Faraday's Law
28. The efficiency of a transformer is typically:
    (a) Less than 50% (b) 50%
    (c) 70% (d) Greater than 90%
29. The core of a transformer is laminated to reduce:
    (a) Hysteresis loss
    (b) Eddy current loss
    (c) Copper loss
    (d) Magnetostriction
30. For a transformer with a turn's ratio of 10:1, if the primary voltage is 220V, the secondary voltage is
    (a) 2200V (b) 22V
    (c) 110V (d) 22kV
31. In a transformer, the primary and secondary windings are:
    (a) Physically connected
    (b) Electrically connected
    (c) Magnetically connected
    (d) Mechanically connected
32. If a transformer has 100 turns on the primary coil and 50 turns on the secondary coil, the primary voltage is 240V. The secondary voltage is:
    (a) 120V (b) 480V

(c) 60V (d) 240V

33. Which of the following is not a type of transformer loss?
(a) Core loss (b) Copper loss
(c) Dielectric loss (d) Friction loss
34. A transformer is rated in:
(a) kW (b) kVA
(c) kWh (d) Amperes
35. The main purpose of using oil in a transformer is:
(a) To lubricate the windings
(b) To insulate and cool the windings
(c) To increase voltage
(d) To decrease current
36. The voltage per turn in the primary and secondary windings of a transformer is:
(a) Different
(b) Same
(c) Dependent on the core material
(d) Dependent on the frequency
37. In an ideal transformer, the power transferred from primary to secondary is:
(a) Increased (b) Decreased
(c) Equal (d) Zero
38. The function of the conservator in a transformer is to:
(a) Maintain constant voltage
(b) Maintain constant current
(c) Provide space for oil expansion
(d) Protect against short circuits
39. Which of the following materials is typically used for transformer cores?
(a) Copper (b) Aluminum
(c) Silicon steel (d) Plastic
40. When the load on the secondary side of a transformer increases, the primary current:
(a) Decreases
(b) Remains the same
(c) Increases
(d) Fluctuates randomly
41. The primary winding of a transformer is connected to:
(a) Load (b) Source
(c) Ground (d) Capacitor
42. Which type of transformer is used to connect circuits of different impedances?
(a) Isolation transformer
(b) Autotransformer
(c) Step-up transformer
(d) Impedance matching transformer
43. If the primary current in a transformer is 2A and the turns ratio is 1:5, the secondary current is:
(a) 10A (b) 0.4A
(c) 2A (d) 1A
44. The leakage flux in a transformer depends on:
(a) The frequency of operation
(b) The load current
(c) The voltage applied
(d) The winding resistance
45. A transformer has 500 turns in the primary coil and 100 turns in the secondary coil. If the primary voltage is 240 V, what is the secondary voltage?
(a) 40 V (b) 45 V
(c) 48 V (d) 58 V
46. A step-down transformer reduces the voltage from 220 V to 55 V. If the primary coil has 880 turns, how many turns are there in the secondary coil?
(a) 200 turns (b) 220 turns
(c) 240 turns (d) 222 turns
47. A transformer has a primary current of 2 A and a primary voltage of 110 V. If the secondary voltage is 220 V, what is the secondary current assuming an ideal transformer?
(a) 1 A (b) 2 A
(c) 3 A (d) 4 A
48. A transformer is designed to convert 120 V to 12 V. If the primary coil has 600 turns, how many turns should the secondary coil have?
(a) 50 turns (b) 60 turns
(c) 70 turns (d) 40 turns
49. A transformer has a power output of 1000 W and an efficiency of 95%. What is the power input?
(a) 1050.63 W (b) 1052.64 W
(c) 1053.63 W (d) 1052.63 W

Solution

Solution: (45)

- $Vs=Vp\times NsNp$Vs=Vp×NpNs
- $Vs=240\times 100500$Vs=240×$_{500100}$
- $Vs=240\times 0.2$Vs=240×0.2
- $Vs=48$Vs=48 V

Solution (46):

- $VsVp=NsNp$VpVs=NpNs
- $55220=Ns880_{22055=880Ns}$
- $14=Ns880_{41=880Ns}$
- $Ns=880\times 14$Ns=880×41
- $Ns=220$Ns=220 turns

Solution (47):

- $Pp=Ps$Pp=Ps (In an ideal transformer, Power is conserved
- $Vp\times Ip=Vs\times Is$Vp×Ip=Vs×Is
- $110\times 2=220\times Is$110×2= 220×Is
- $220=220\times Is$220=220×Is
- $Is=1$Is=1 A

Solution (48):

- $VsVp=NsNp_{VpVs=NpNs}$
- $12120=Ns600_{12012=600Ns}$
- $110=Ns600_{101=600Ns}$
- $Ns=600\times 110$Ns=600×$_{101}$
- $Ns=60$Ns=60 turns

Solution (49):

- Efficiency $\eta=PoutPin\times 100$η=PinPout×100
- $95=1000Pin\times 10095=_{PinPout1000}\times 100$
- $Pin=1000\times 10095$Pin=$_{951000\times 100}$
- $Pin=10000095$Pin=95100000
- $Pin\approx 1052.63$Pin ≈1052.63 W

Answer key

1	**C**	11	**C**	21	**D**	31	**C**	41	**B**
2	**C**	12	**C**	22	**C**	32	**A**	42	**D**
3	**C**	13	**A**	23	**D**	33	**D**	43	**B**
4	**A**	14	**C**	24	**D**	34	**B**	44	**B**
5	**C**	15	**C**	25	**B**	35	**B**	45	**C**
6	**C**	16	**A**	26	**B**	36	**B**	46	**B**
7	**A**	17	**B**	27	**C**	37	**C**	47	**A**
8	**B**	18	**B**	28	**D**	38	**C**	48	**B**
9	**B**	19	**B**	29	**B**	39	**C**	49	**D**
10	**C**	20	**C**	30	**B**	40	**C**		