Name: _____ **Class:** _____ **Date:** _____ **ID: A**

Day 4 Transformer Practice Questions

Multiple Choice
Identify the choice that best completes the statement or answers the question.

1. A transformer is used to step up the voltage in a line from 12 V to 54 V. If there are 250 turns in the primary coil, how many turns of wire are there in the secondary coil?
   a. 2.13×10^2
   b. 1.13×10^3
   c. 1.32×10^3
   d. 2.94×10^2

2. A 92% efficient transformer has 12 V and 50 turns in the primary coil, what is the secondary voltage if there are 10 turns in the secondary coil?
   a. 2.2 V
   b. 5.0 V
   c. 42 V
   d. 500 V

3. A step-up transformer increases
   a. power
   b. energy
   c. both of the above
   d. none of the above

4. The principal advantage of AC power over DC power is that
   a. less energy is dissipated during transmission
   b. AC voltage oscillates while DC voltage does not
   c. AC voltage can be transformed more easily
   d. AC circuits multiply power more easily
   e. AC circuits are safer

5. A step-up transformer has a ratio of one to ten. If 100 W of power go into the primary coil, the power coming from the secondary coil is
   a. 1W
   b. 10 W
   c. 100 W
   d. 1000 W
   e. none of these

6. The voltage across the input terminals of a transformer is 110 V. The primary has 50 loops and the secondary has 25 loops. The output voltage is
   a. 25 V
   b. 55 V
   c. 110 V
   d. 220 V
   e. none of these

7. A transformer has 525 turns on the primary coil and 105 turns on the secondary. If the voltage across the primary coil is 120 V AC, what is the induced emf across the secondary coil?
   a. 24.0 V AC
   b. 120 V AC
   c. 459 V AC
   d. 600 V AC

8. A transformer has 524 turns on the primary coil and 145 turns on the secondary. If the potential difference across the primary coil is 124 V ac, what emf is induced in the secondary?
   a. zero
   b. 34.3 V ac
   c. 124 V ac
   d. 448 V ac

9. Which of the following statements accurately describes an ideal step up transformer?
   a. The primary power is higher than the secondary power
   b. The primary voltage is higher than the secondary voltage
   c. The secondary power is higher than the primary power
   d. The secondary voltage is higher than the primary voltage.

10. The primary of a transformer has 855 turns and the secondary has 1250 turns. The voltage across the primary is 115 V AC and the current through it is 5.00 A. What is the voltage across the secondary of the transformer?
    a. 78.7 V
    b. 115 V
    c. 119 V
    d. 168 V

11. A transformer has 525 turns on the primary coil and 105 turns on the secondary. If the voltage across the primary coil is 120 V AC, what is the induced EMF across the secondary coil?
    a. 24 V
    b. 120 V
    c. 459 V
    d. 600 V

12. A transformer is used to step up the voltage in a line from 6.0 V to 48 V. If there are 200. loops in the primary coil, how many loops would there be in the secondary coil?
    a. 1.4
    b. 8.0
    c. 288
    d. 1600

13. A student designs a transformer with 12 turns of wire in the primary coil and 48 turns in the secondary. He then connects the primary to an 8.0 volt DC cell. After the initial pulse, what would the voltage across the secondary be?
    a. zero Volts
    b. 2.0 Volts
    c. 8.0 Volts
    d. 32 Volts

14. A transformer has N_p turns on the primary, N_s turns on the secondary, a current of I_p through the primary and a current of I_s through the secondary. If the transformer is a step-up transformer, how does N_p compare with N_s and I_p and I?
    a. $N_p < N_s$ and $I_p > I_s$
    b. $N_p > N_s$ and $I_p > I_s$
    c. $N_p < N_s$ and $I_p < I_s$
    d. $N_p > N_s$ and $I_p < I_s$

15. Four amps of current exist in the primary coil of a transformer. The voltage across the primary coil is 110 V. What is the output of the secondary coil?
    a. less than 30 W
    b. 110 W
    c. 440 W
    d. not enough information to say

16. A transformer has 40 times as many turns on the secondary coil as on the primary coil. If the voltage across the primary coil is 65 V AC, what emf is induced across the secondary coil?
    a. 0.62 V
    b. 1.6 V
    c. 65 V
    d. 2600 V

17. A transformer is designed to have a primary voltage of 12 000 V ac and a secondary voltage of 60 000 V ac. If the number of turns in the primary circuit is 2 000, how many turns should be in the secondary winding, and will this be a step-up or a step-down transformer?

	Number of Turns	Type of Transformer
a.	400	step-up
b.	400	step-down
c.	10 000	step-up
d.	10 000	step-down

18. The primary of a transformer has 855 turns and the secondary has 1250 turns. The voltage across the primary is 115 V and the current through it is 5.00 A. Assume that the transformer is 100 % efficient. What is the average power available from the secondary?
    a. 23 W
    b. 393 W
    c. 575 W
    d. 840 W

19. The secondary coil of a transformer has 400 turns while the primary has 100. What is the secondary current if there is a steady direct current of 2.0 A in the primary?
    a. 0
    b. 0.5 A
    c. 2.0 A
    d. 8.0 A

Day 4 Transformer Practice Questions
Answer Section

MULTIPLE CHOICE

1. ANS: C PTS: 1 TOP: Transformers
2. ANS: A PTS: 1 TOP: Transformers
3. ANS: D
   Conservation of energy cannot be violated. Step-up transformer increases the voltage.

   PTS: 1 DIF: K TOP: Transformers
4. ANS: C
   Transformers use AC voltage and so can be used to step up or step down voltages easier than DC voltage.

   PTS: 1 DIF: K TOP: Transformers
5. ANS: C
   Conservation of energy cannot be violated, so energy in = energy out. This translates into power in = power out.

   PTS: 1 DIF: K TOP: Transformers
6. ANS: B
   $\frac{V_s}{V_p} = \frac{N_s}{N_p}$

   $V_s = \frac{V_p N_s}{N_p} = \frac{(110)(25)}{50} = 55V$

   PTS: 1 DIF: U TOP: Transformers
7. ANS: A
   $\frac{V_s}{V_p} = \frac{N_s}{N_p}$

   $V_s = \frac{V_p N_s}{N_p} = \frac{(120)(105)}{525} = 24V$

   PTS: 1 DIF: U TOP: Transformers

8. ANS: B

$$\frac{V_s}{V_p} = \frac{N_s}{N_p}$$

$$V_s = \frac{V_p N_s}{N_p} = \frac{(124)(145)}{524} = 34.3V$$

PTS: 1 DIF: U TOP: Transformers

9. ANS: D

Step up transformer increases the voltage.

PTS: 1 DIF: U TOP: Transformers

10. ANS: D

$$\frac{V_s}{V_p} = \frac{N_s}{N_p}$$

$$V_s = \frac{V_p N_s}{N_p} = \frac{(115)(1250)}{855} = 168V$$

PTS: 1 DIF: U TOP: Transformers

11. ANS: A

$$\frac{V_s}{V_p} = \frac{N_s}{N_p}$$

$$V_s = \frac{V_p N_s}{N_p} = \frac{(120)(105)}{525} = 24V$$

PTS: 1 DIF: U TOP: Transformers

12. ANS: D

$$\frac{V_s}{V_p} = \frac{N_s}{N_p}$$

$$N_s = \frac{N_p V_s}{V_p} = \frac{(200)(48)}{6.0} = 1600$$

PTS: 1 DIF: U TOP: Transformers

13. ANS: A

Zero voltage, since there is no change in flux

PTS: 1 DIF: K TOP: Transformers

14. ANS: A
Step up transformer ($N_s > N_p$) increases voltage in the secondary and reduces current in the secondary. Using P=VI, the power must be the same on both sides of the transformer. Therefore, if the voltage goes up, the current must go down (According to $V_pI_p = V_sI_s$)

so $I_p > I_s$

PTS: 1 DIF: K TOP: Transformers

15. ANS: C
Input power = output power, so P = VI
P = 110 x 4
P = 440 W

PTS: 1 DIF: U TOP: Transformers

16. ANS: D
$$\frac{V_s}{V_p} = \frac{N_s}{N_p}$$

$$V_s = \frac{V_p N_s}{N_p} = \frac{(65)(40)}{1} = 2600V$$

PTS: 1 DIF: U TOP: Transformers

17. ANS: C
$$\frac{V_s}{V_p} = \frac{N_s}{N_p}$$

$$N_s = \frac{N_p V_s}{V_p} = \frac{(2000)(60000)}{12000} = 10000$$

N_s = 10 000, since voltage is increased in the secondary this is a step up transformer

PTS: 1 DIF: U TOP: Transformers

18. ANS: C
$P_s = P_p$
$P_s = V_pI_p$
P_s = 115 x 5.0
P_s = 575 W

PTS: 1 DIF: U TOP: Transformers

19. ANS: A
No current in secondary, since DC current in primary.

PTS: 1 DIF: K TOP: Transformers