

1. Gibb's free energy equation is directly related to _____ and _____.

- A. Work and Time
- B. Heat and Work
- C. Enthalpy and Entropy
- D. Power and Enthalpy

2. Which of the following is correct expression for Gibbs' free energy formula?

- A. $DG = DH - TDS$
- B. $G = H - TS$
- C. $DG = DH - T/S$
- D. $G = H - T/S$

3. Which of the following is the correct expression of Bernoulli's principle?

- A. As KE increases, another form of energy must decrease.
- B. As KE increases, other forms of energy also increase.
- C. KE remains relatively stable in a closed loop.
- D. KE has a limited effect upon wavelength.

4. Which of the following is the correct expression for work?

- A. $W = DKE$
- B. $W = K - DE$
- C. $W = K \times DE$
- D. $W = DK / DE$

5. A spring has a spring constant of 120 newtons per meter. How much potential energy is stored in the spring as it is stretched .20 meter?

- A. 1.2 J
- B. 2.4 J
- C. 3.1 J
- D. 7.4 J

6. A distance of 1.0×10^3 separates the charge at the bottom of the cloud and the ground. The electric field intensity between the bottom of the cloud and the ground is 2.0×10^4 newtons per coulomb. What is the potential difference between the bottom of the cloud and the ground?

- A. 1.4×10^4 V
- B. 2.5×10^3 V
- C. 2.8×10^6 V
- D. 2.0×10^7 V

7. When Adam drinks cold water, his body warms the water until thermal equilibrium is reached. If he drinks six glasses (2.5 kilograms) of water at 0 degrees Celsius in a day, approximately how much energy must his body expend to raise the temperature of this water to his body's temperature of 37 degrees Celsius?

- A. 210 kJ

- B. 305 kJ
- C. 390 kJ
- D. 414 kJ

8. An electron is located between a pair of oppositely charged parallel plates. As the electron approaches the positively charged plate, the kinetic energy of the electron?

- A. Increases
- B. Decreases
- C. Remains the same

9. If the speed of a moving object is doubled, which quantity also associated with the object must double?

- A. Momentum
- B. KE
- C. Gravitational potential energy
- D. Acceleration

10. A 45 kilogram bicyclist climbs a hill at a constant speed of 2.5 meters per second by applying an average force of 85 Newtons. Approximately how much power does the bicyclist develop?

- A. 115 W
- B. 210 W
- C. 250 W
- D. 320 W

11. A person kicks in a 4.0 kilogram door with a 48 Newton force causing the door to accelerate at 12 meters per second². What is the magnitude of the force exerted by the door on the person?

- A. 24 N
- B. 35 N
- C. 42 N
- D. 48 N

12. A 60 kilogram student running at 3.0 meters per second has a kinetic energy of ____.

- A. 111 J
- B. 151 J
- C. 260 J
- D. 270 J

13. How much work is done in moving 5.0 coulombs of charge against a potential difference of 12 volts?

- A. 30 J
- B. 60 J
- C. 400 J
- D. 400 J
- E. 500 J

14. Compared to insulators, metals are better conductors of electricity because metals contain more free ____.

- A. Protons
- B. Electrons
- C. Neutrons
- D. Neutrons
- E. Positive ions

15. How much time is required for an operating 100 W light bulb to dissipate 10 Joules of electrical energy?

- A. 1 sec.
- B. .1 sec
- C. .25 sec
- D. 200 sec

Answer Key

- 1. C
- 2. A
- 3. A
- 4. A
- 5. B
- 6. D
- 7. C
- 8. A
- 9. A
- 10. B
- 11. D

12. D

13. B

14. B

15. B