Take-Home Test Questions Multiple Choices (2 points per question for a total of 50). Due Tuesday April 18th

Use 10 m/s^2 for the gravity of Earth

1. What physics can be used to explain that passengers tend to move forward when the moving vehicles brake?
    a. F = ma
    b. Action-Reaction
    c. Law of Inertia
    d. None of the above
2. A 1200 kg car is accelerating to 3 m/s^2. What's the force acting on it?
    a. 0 N
    b. 400 N
    c. 1200 N
    d. 3600 N
3. What's the weight of a 75-kg person on Earth?
    a. 0 N
    b. 75 N
    c. 750 N
    d. Not enough information.
4. What's the work done by a person holding a 2-kg textbook moving 10 m across the hallway?
    a. 0 J
    b. 20 J
    c. 200 J
    d. None of the above.
5. A 2-kg jar is pushed along the kitchen counter for 2 meters with a force of 2 N. What's the work done on the jar?
    a. 0 J
    b. 4 J
    c. 6 J
    d. 8 J
6. A car with 2000 J of kinetic energy is accelerated to 3500 J of kinetic energy after some time. What's the work done to the car by the engine?
    a. 0 J
    b. 1500 J
    c. 3500 J
    d. 5500 J
7. What's the potential energy of a 75-kg man standing on the top of 100 m tall building?
    a. 0 J
    b. 750 J
    c. 7500 J
    d. 75000 J

8. What's the dropping height if the speed an object is 20 m/s right before if strikes the floor?
    a. 400 m
    b. 200 m
    c. 50 m
    d. None of the above
9. A pendulum has maximum kinetic energy at _____.
    a. the highest point
    b. the lowest point
    c. everywhere in the path
    d. Not enough information.
10. A pendulum has maximum potential energy at _____.
    a. the highest point
    b. the lowest point
    c. everywhere in the path
    d. Not enough information.
11. The highest point of a roller-coaster ride is 75 m. What's the fastest speed the coaster can achieve assuming no friction?
    a. 0 m/s
    b. About 40 m/s
    c. About 75 m/s
    d. Not enough information
12. A circuit with a 3 Ω resistor and a 12 V battery. What's the power of the circuit?
    a. 4 W
    b. 36 W
    c. 48 W
    d. None of the above.
13. A circuit with 3 Ω, 3 Ω and 5 Ω resistors are connected parallel. What's the total resistance of the circuit?
    a. 8 Ω
    b. 11 Ω
    c. 13/15 Ω
    d. 15/13 Ω
14. A circuit is connected parallel by two resistors, 1 Ω and 2 Ω . _____ current will flow through the lower resistance.
    a. More
    b. Less
    c. The same
    d. Not enough information
15. According to Theory of Relativity, which one of the following is incorrect?
    a. Gravity and acceleration are the same thing.
    b. Time is not absolute.
    c. Simultaneity can only happen in one frame of reference.
    d. Speed of light is varied.

16. Which one of the following about photoelectric effect is correct?
    a. Electrons in a metal can absorb all energy ranges of the photon.
    b. Light is a particle.
    c. Light is a wave.
    d. The interference of light can cause electrons to interfere themselves.
17. According to Einstein, the relationship between the space-time continuum and mass is_____.
    a. that mass can alter the space-time by creating a void causing objects to fall to it
    b. that mass can alter the space-time by creating a dent causing objects to move along the curvature.
    c. that mass can alter the space-time by creating another space-time that interfere with the original space-time.
    d. None of the above.
18. A -20^{o}C ice is heated up continuously. Which one of the following is incorrect?
    a. The temperature will stay at 0^{o}C until all ice turned to 0^{o}C water.
    b. The temperature will start to rise after all ice turned to water.
    c. The temperature will continue to rise at 0^{o}C because ice will turn to water at 0^{o}C.
    d. The temperature will rise from -20^{o}C.
19. Which one of the following is not a property of light?
    a. Law of Reflection
    b. Law of Refraction
    c. Law of Diffraction
    d. Law of Diffusion
20. Which one of the following is used to prove that light is a wave?
    a. Photoelectric Effect
    b. Single-slit Experiment
    c. Double-slits Experiment
    d. None of the above.
21. Mirage can be explained by _____.
    a. Law of Reflection
    b. Law of Refraction
    c. Law of Diffraction
    d. Photoelectric Effect
22. Object in water is seen at an angle from air by an observer. The actual object will be _____ as it appears.
    a. closer
    b. further
    c. the same place
    d. None of the above.
23. When light passes from air to water at an incident angle greater than 0^{o}, it will bend _____.
    a. toward the normal
    b. away from the normal

c. toward and then away from the normal
d. Not enough information.

24. Which of the following is correct about the Law of Reflection?
    a. The angle of incident is greater than the angle of reflection.
    b. The angle of incident is smaller than the angle of reflection.
    c. The angle of incident is the same as the angle of reflection.
    d. The angles of incident and reflection are measured off the mirror.
25. Which laws are used to show the multiple colors of bubbles?
    a. Law of Reflection and Law of Diffraction
    b. Law of Diffraction and Law of Refraction
    c. Law of Refraction and Law of Reflection
    d. Law of Reflection and Law of Diffusion