T F 1  Power is the amount of work done divided by the time to do the work.

T F 2. The energy an object has because of its position is called potential energy.

T F 3. A 40 horsepower motor can do more work than a 80 horsepower motor.

T F 4. You do the same work when you run up a flight of stairs as when you walk slowly.

T F 5. Energy is not conserved in chemical and biological processes.

T F 6. According to Newton’s third law, for every action there is an equal reaction.

7. The acceleration due to gravity on the moon is one-sixth the acceleration due to gravity on the earth. An object that weighs 20 Newtons on the moon will weigh _____ Newtons on the earth.
   A. 10  B. 120  C. 360  D. None of these

8. The watt (W) is a unit of
   A. work  B. electrical energy  C. power  D. force

9. When a light bulb is rated at 60 W, it means that
   A. the bulb uses 60 J of power when it is lit.
   B. current is traveling at 60 m/sec through the filament.
   C. each second, the bulb converts 60 J of electrical energy to heat and light.

10. Kinetic energy refers to
    A. energy of motion  B. energy of position
    C. energy stored in fossil fuels  D. electrical energy

11. The _____ of a body is the gravitational force acting upon it.
    A. weight  B. mass  C. density  D. matter

12. According to Newton’s second law, acceleration is
    A. inversely proportional to the applied force.
    B. directly proportional to the mass of the object.
    C. something that increases if the mass increases.
    D. None of the above.

13. While exploring an ancient Mayan tomb, you discover that the walls are closing in on you. By exerting 400 N of force, you are able to keep the wall from coming closer. The work you are doing on the wall is
    A. 400 J
    B. 3920 J
    C. unknown, because the mass of the wall is not given.
    D. zero, because the wall is not moving.

14. A 20 horsepower motor lifts an elevator car to the top of an 8 story building in 60 seconds. An 80 horsepower motor will lift the car to the top in _________ seconds.
    A. 40  B. 15  C. 20  D. 80
15. What type of energy is stored in the gas that you put into your car?
A. potential  B. kinetic  C. heat  D. chemical

16. A 250 Calorie (food calorie) candy bar contains __________ Joules of energy.
A. 1260000  B. 1050000  C. 1.68 million  D. 840000
E. None of the above

17. A wheel and axle is designed to _____________.
A. increase IMA  B. reduce friction  C. decrease IMA  D. reduce AMA

18. The most common lever in the human body is a __________ class lever.
A. first  B. second  C. third  D. fourth

19. The human body uses levers to _____________.
A. amplify force  B. diminish distance  C. amplify distance  D. diminish force

20. A machine can be used to _____________.
A. magnify force  B. diminish force  C. magnify motion  D. diminish motion
E. All of the above

21. A pendulum is pulled back to position A, then released. Where is its kinetic energy the maximum?
A. A and E  B. B  C. C  D. D and B  E. E and C

22. What is the IMA of the incline below?
A. 20  B. 4  C. 6  D. 100

23. What is the AMA of the incline above?
A. 20  B. 40  C. 10  D. 250
E. None of the above, you need to find the forces to find AMA

24. What is the AMA of the lever shown below if the force meter indicates 40 N and the block weighs 100 N?
A. 2.5  B. 100  C. 20  D. 5

25. What is the IMA of the lever shown to the right if the force meter indicates 40 N and the block weighs 100 N?
A. 2.5  B. 3  C. 20  E. None of the above
26. What class lever is shown to the right?  
A. first  
B. second  
C. third  

27. The same net force is applied to object A and object B.  
The observed accelerations of the two objects are not the same; object A has an acceleration that is one-third that of object B.  
Which of the following is correct?  
A. Object A has three times the mass of object B.  
B. Object A has one-third the mass of object B.  
C. Object A has a different, less streamlined shape than object B.  
D. Object A has more friction than object B.  

28. The acceleration due to gravity of a falling object at the surface of the earth is  
A. 0.98 meter/second$^2$.  
B. 9.8 second$^2$.  
C. dependent on the mass of the object.  
D. 9.8 meter/second$^2$.  

29. Inertia is a measure of an object’s ________.  
A. weight.  
B. force.  
C. mass.  
D. gravity.  
E. center of mass.  

30. An object is dropped off a cliff. What is its speed 3.5 seconds later?  
A. 25 m/s  
B. 35 m/s  
C. 50 m/s  
D. 80 m/s  

31. If a ball falls 100 meters, how fast will it be going when it hits the ground?  
A. 32 m/s  
B. 52 m/s  
C. 45 m/s  
D. 100 m/s  

32. How far will a ball fall in 3.5 seconds if we ignore air resistance?  
A. 30 m  
B. 60 m  
C. 100 m  
D. 500 m  

33. A sheet of paper can be withdrawn from under a container of milk without toppling it if the paper is jerked quickly. This best demonstrates that ______.  
A. the milk carton has no acceleration.  
B. there is an action-reaction pair of forces.  
C. gravity tends to hold the milk carton secure.  
D. the milk carton has inertia.  
E. none of these.  

34. The mass that was accelerated in the Scootin’ Newton activity was ________.  
A. the mass of the cart  
B. the mass of the cart and any masses placed on the cart  
C. the mass of the cart, any masses placed on it and the mass in the cup.  
D. NOTA, it depends on how much mass was in the cup
REFER TO THE CASE 1 AND CASE 2 GRAPHS AT THE END OF THE TEST IN ORDER TO ANSWER THE FOLLOWING QUESTIONS.

35. What type of motion in case 1 occurs from 14 to 20 seconds?
   A. The object is slowing down.
   B. The object is speeding up.
   C. The object has constant speed.
   D. None of the above

36. The motion of an object that is represented between points 0 and J on the CASE 1 graph and the motion of an object that is represented between points L and M on the CASE 2 graph have something in common. What is it that they have in common?
   A. Both objects possess non-zero acceleration.
   B. Both objects possess zero acceleration.
   C. Both objects are traveling at constant speed.
   D. Both object’s motions possess nothing in common.
   E. Both B and C are correct

37. What is the velocity of the object in CASE 2 during the time interval between points L and M?
   A. 5 m/s
   B. 6.9 m/s
   C. 55 m/s
   D. Zero

38. What was the average velocity of the object represented by CASE 2 over the interval from 0 to 20 seconds?
   A. 6 m/s
   B. 50 m/s
   C. 17 m/s
   D. NOTA