Chapter 7 practice

MULTIPLE CHOICE. Choose the one alternative that best completes the statement or answers the question.

1) The work done in pushing a TV set a distance of 2 m with an average force of 20 N is 1) _____
A) 2 J. B) 10 J. C) 20 J. D) 40 J. E) 800 J.

2) The work you do when pushing a shopping cart twice as far while applying twice the force is 2) _____
A) half as much. B) twice as much.
C) four times as much. D) the same amount.

3) No work is done by gravity on a bowling ball that rolls along a bowling alley because 3) _____
A) no force acts on the ball.
B) little distance is covered by the ball.
C) the force on the ball is at right angles to the ball's motion.
D) the ball's speed remains constant.

4) The unit kilowatt–hour is a unit of 4) _____
A) energy. B) momentum. C) power. D) time.

5) Which task requires more work? 5) _____
A) lifting the 50–kg sack 2 meters B) lifting the 25–kg sack 4 meters
C) both require the same D) need more information

6) The amount of work done on a heavy box carried by Nellie across a room at a constant speed 6) _____
A) depends on the weight of the box.
B) depends on the distance walked.
C) depends on both weight of the box and distance walked.
D) is none.
E) none of the above

7) If you do work on a skateboard loaded with friends in one–third the usual time, you expend 7) _____
A) one third as much power. B) the usual power.
C) three times the usual power. D) need more information.

8) The power required to exert 4–N force over 3 meters in 2 seconds is 8) _____
A) 4 W.
B) 6 W.
C) 8 W.
D) 12 W.
E) none of the above

9) An object has gravitational potential energy due to its 9) _____
A) speed.
B) acceleration.
C) momentum.
D) location.
E) none of the above

10) Relative to an initial height, an object raised twice as high has a gravitational potential energy 10) _____
A) half as much
B) twice as much.
C) four times as much.
D) need more information

11) When a drawn bow of potential energy 40 J is fired, the arrow will *ideally* have a kinetic energy 11) _____
A) less than 40 J.
B) more than 40 J.
C) of 40 J.

12) A clerk can lift cylindrical packages 1 meter vertically, or can roll them up a 2–meter–long ramp to the same elevation. With the ramp, the applied force required is about 12) _____
A) half as much.
B) the same.
C) twice as much.
D) four times as much.

13) A 2–kg ball is held 4 m above the ground. Relative to the ground its potential energy is 13) _____
A) 6 J.
B) 8 J.
C) 32 J.
D) 80 J.
E) more than 80 J.

14) A 2–kg box of taffy candy has 40 J of potential energy relative to the ground. Its height above the ground is 14) _____
A) 1 m.
B) 2 m.
C) 3 m.
D) 4 m.
E) none of the above

15) An object that has kinetic energy must be 15) _____
A) moving.
B) falling.
C) at an elevated position.
D) at rest.
E) none of the above

16) Two identical golf carts move at different speeds. The faster cart has twice the speed and therefore has 16) _____
A) twice the kinetic energy.
B) four times the kinetic energy.
C) eight times the kinetic energy.
D) none of the above

17) A melon is tossed straight upward with 100 J of kinetic energy. If air resistance is negligible the melon will return to its initial level with a kinetic energy of 17) _____
A) less than 100 J.
B) more than 100 J.
C) 100 J.
D) need more information

18) Danny Diver weighs 500 N and steps off a diving board 10 m above the water. Danny hits the water with kinetic energy of 18) _____

A) 10 J.
B) 500 J.
C) 510 J.
D) 5000 J.
E) more than 5000 J.

19) Which has greater kinetic energy? 19) _____

A) a car traveling at 30 km/hr
B) a car of half the mass traveling at 60 km/hr
C) both the same
D) need more information

20) Neglecting air resistance, Sammy Smarts on a high ladder releases a ball that strikes the ground with 100 J of kinetic energy. If he were to instead throw the ball straight upward, it will soon reach the ground with a kinetic energy of 20) _____

A) less than 100 J. B) 100 J. C) more than 100 J.

21) If a Ping–Pong ball and a golf ball both move in the same direction with the same amount of kinetic energy, the speed of the Ping–Pong ball must be 21) _____

A) less than the golf ball. B) more than the golf ball.
C) both the same D) need more information

22) Two identical particles move toward each other, one twice as fast as the other. Just before they collide, one has a kinetic energy of 25 J and the other 50 J. At this instant their total kinetic energy is 22) _____

A) 25 J.
B) 50 J.
C) 75 J.
D) none of the above
E) need more information

23) When Joshua brakes his speeding bicycle to a stop, kinetic energy is transformed to 23) _____

A) potential energy. B) energy of motion.
C) energy of rest. D) heat.

24) A motorcycle moving at 50 km/h skids 10 m with locked brakes. How far will it skid with locked brakes when traveling at 150 km/h? 24) _____

A) 10 m B) 30 m C) 50 m D) 90 m

25) About 40 J is required to push a crate 4 m across a floor. If the push is in the same direction as the motion of the crate, the force on the crate is about 25) _____

A) 4 N. B) 10 N. C) 40 N. D) 160 N.

26) Which requires the most amount of work by the brakes of a car? 26) _____

A) slowing down from 100 km/h to 70 km/h
B) slowing down from 70 km/h to a stop
C) equal amounts for both

27) A ball rolling down an incline has its maximum potential energy at 27) _____

A) the top.
B) a quarter of the way down.
C) halfway down.
D) the bottom.

28) The bob of a simple pendulum has its maximum kinetic energy at the 28) _____

A) top of its swing.
B) bottom of its swing.
C) midpoint between top and bottom.
D) at all points along its path of swing.

29) A light aluminum ball and a heavy lead ball of the same size roll down an incline. When they are halfway down the incline, they will have identical 29) _____

A) kinetic energies.
B) potential energies.
C) momentum.
D) inertias.
E) none of the above

30) Strictly speaking, more fuel is consumed by your car if the air conditioner, headlights, or even a radio is turned on. This statement is 30) _____

A) false.
B) true only if the car's engine is running.
C) true.

31) A circus diver drops from a high pole into water far below. When he is halfway down 31) _____

A) his potential energy is halved.
B) he has gained an amount of kinetic energy equal to half his initial potential energy.
C) his kinetic energy and potential energy are equal.
D) all of the above
E) none of the above

32) Acrobat Bart at the circus drops vertically onto the end of a see–saw, with his partner Art equidistant from the fulcrum at the other end. Art is propelled straight upward a distance twice that of Bart's dropping distance. Neglecting inefficiencies we see 32) _____

A) the masses of Art and Bart are equal.
B) Art has half the mass of Bart.
C) need more information

33) A 1–kg ball dropped from 2 m rebounds only 1.5 m after hitting the ground. The amount of energy converted to heat is about 33) _____

A) 0.5 J.
B) 1.0 J.
C) 1.5 J.
D) 2.0 J.
E) more than 2.0 J.

34) A hydraulic press, like an inclined plane, is capable of increasing energy. 34) _____

A) sometimes true
B) always false
C) always true
D) sometimes false

35) A hydraulic jack is used to lift objects such as automobiles. If the input force is 200 N over a distance of 1 meter, the output force over a distance of 0.1 meter is ideally 35) _____
A) 200 N.
B) 500 N.
C) 1000 N.
D) 2000 N.
E) none of the above

36) Phil applies 100 N to a pulley system and raises a load one-tenth of his downward pull. Ideally, the weight of the load is 36) _____
A) 100 N.
B) 1000 N.
C) 10,000 N.
D) more than 10,000 N

37) A hydraulic press has its input piston depressed 20 centimeters while the output piston is raised 1 centimeter. A 1-newton input can lift a load of 37) _____
A) 1 N.
B) 10 N.
C) 15 N.
D) 20 N.
E) none of the above

38) A machine puts out 100 watts of power for every 1000 watts put into it. The efficiency of the machine is 38) _____
A) 10%.
B) 50%.
C) 90%.
D) 110%.
E) none of the above

39) A jack system will increase the potential energy of a heavy load by 1000 J with a work input of 2000 J. The efficiency of the jack system is 39) _____
A) 10%.
B) 20%.
C) 50%.
D) 80%.
E) need more information

40) Earth's primary energy source is 40) _____
A) the Sun.
B) fossil fuel.
C) electricity.
D) geothermal.

41) Hydro and wind power are indirect forms of 41) _____
A) solar energy.
B) fossil fuels deep down.
C) nuclear energy in Earth's interior.
D) none of the above

42) A machine that promises more energy output than input is 42) _____
A) a fantasy.
B) commonplace in today's technology.
C) a long-shot worth investing in.

43) The most concentrated form of energy is 43) _____
A) wind. B) fossil fuel. C) geothermal. D) nuclear.

44) The exhaust product from a hydrogen fuel cell is 44) _____
A) carbon dioxide. B) methane.
C) pure water. D) nitric acid.

45) A primary difference between momentum and kinetic energy is 45) _____
A) momenta can cancel; kinetic energy cannot.
B) kinetic energy can cancel; momenta cannot.
C) either of the above depending on circumstances
D) none of the above

46) Impulse involves the time that a force acts, whereas work involves the 46) _____
A) distance that a force acts.
B) time and distance that a force acts.
C) acceleration that a force produces.

47) A moving object has 47) _____
A) speed.
B) velocity.
C) momentum.
D) energy.
E) all of these

48) If the speed of a motor scooter doubles, which of the following also doubles? 48) _____
A) momentum B) kinetic energy
C) acceleration D) all of the above

49) Two 2-m/s pool balls roll toward each other and collide. Suppose after bouncing apart each moves at 4 m/s. This collision violates the conservation of 49) _____
A) momentum. B) energy.
C) both momentum and energy. D) none of the above

50) A golf ball is thrown at and bounces backward from a massive bowling ball that is initially at rest. After the collision, compared to the golf ball, the bowling ball has more 50) _____
A) momentum, but less kinetic energy. B) kinetic energy, but less momentum.
C) momentum and more kinetic energy. D) need more information

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

50) A