Conceptual Integrated Science 3rd edition Hewitt Test Bank

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Conceptual Integrated Science, 3e **(Hewitt et al.)**
Chapter 2 Describing Motion

Multiple Choice Questions

1) Aristotle asserted that motion was characterized by
A) natural motion.
B) violent motion.
C) both of these
D) neither of these
Answer: C
Diff: 1
Objective: 2.1

2) Aristotle's view of natural laws is best understood by
A) experiment.
B) reasoning.
C) patterns.
D) mathematics.
Answer: B
Diff: 1
Objective: 2.1

3) When Galileo dropped balls from the Leaning Tower of Pisa, he
A) confirmed Aristotle's teachings.
B) refuted Aristotle's teachings.
C) failed in their purpose.
D) none of the above
Answer: B
Diff: 1
Objective: 2.1

4) A heavy and a light ball are dropped at the same time from a high tower. The ball to reach the ground first, assuming no air resistance, will be the
A) heavier ball.
B) lighter ball.
C) both together.
D) none of the above
Answer: C
Diff: 1
Objective: 2.1

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5) In contrast to Aristotle's statements about nature, Galileo's reliance was on
A) experiment.
B) logic.
C) patterns.
D) mathematics.
Answer: A
Diff: 1
Objective: 2.2

6) Science greatly moved forward when Galileo favored
A) philosophical discussions.
B) experiment.
C) non-mathematical thinking.
D) none of the above
Answer: B
Diff: 1
Objective: 2.2

7) Galileo stated that a ball rolled along a level surface it would
A) slow down due to its natural tendency to come to rest.
B) keep rolling without slowing down if no friction acted upon it.
C) roll as long as its inertia nudged it along.
D) eventually roll in the opposite direction.
Answer: B
Diff: 1
Objective: 2.2

8) When Galileo rolled a ball down and up an incline, he found that the ball rolled nearly to
A) its initial height.
B) halfway its original height.
C) three-quarters its original height.
D) higher than its original height.
Answer: A
Diff: 1
Objective: 2.2

9) According to Aristotle, a rolled ball eventually comes to a stop because
A) of friction.
B) of inertia.
C) it seeks its natural state of rest.
D) all of the above
Answer: C
Diff: 1
Objective: 2.2

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10) According to Galileo, a rolled ball eventually comes to a stop because
A) of friction.
B) of inertia.
C) it seeks its natural state of rest.
D) all of the above
Answer: A
Diff: 1
Objective: 2.2

11) The first scientist to be credited for discovering the concept of inertia was
A) Aristotle.
B) Galileo.
C) Newton.
D) Copernicus.
Answer: B
Diff: 1
Objective: 2.2

12) In Galileo's thinking, inertia is a
A) force like any other force.
B) special kind of force.
C) property of all matter.
D) concept opposite to force.
Answer: C
Diff: 1
Objective: 2.2

13) According to Galileo, the test of scientific truth is
A) experiment.
B) philosophical discussion.
C) evident patterns in nature.
D) logic.
Answer: A
Diff: 1
Objective: 2.2

14) A moving probe in space continues in its motion due to
A) very low friction.
B) its own inertia.
C) it seeking a continued state of motion.
D) none of the above
Answer: B
Diff: 2
Objective: 2.2

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15) Which has more mass?
A) A fluffed-up king-size pillow
B) A scrunched-up king-size pillow
C) An automobile battery
D) all about the same
Answer: C
Diff: 1
Objective: 2.3

16) A kilogram relates to an object's
A) weight.
B) force.
C) mass.
D) gravity.
Answer: C
Diff: 1
Objective: 2.3

17) Between weight and mass, the more fundamental quantity is
A) mass.
B) weight.
C) both the same
D) none of the above
Answer: A
Diff: 1
Objective: 2.3

18) Mass is a more fundamental quantity than weight because mass
A) does not depend on gravity.
B) does not vary with location.
C) both of these
D) none of the above
Answer: C
Diff: 2
Objective: 2.3

19) A block of matter will weigh
A) less on the Moon.
B) less on the Earth.
C) the same on both.
D) need more information
Answer: A
Diff: 2
Objective: 2.3

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20) A 1-kg block of iron has a weight of about
A) 1 N.
B) 5 N.
C) 10 N.
D) more than 10 N.
Answer: C
Diff: 1
Objective: 2.3

21) Shake an object to and fro to best judge an object's
A) mass.
B) weight.
C) both the same
D) none of the above
Answer: A
Diff: 1
Objective: 2.3

22) Lifting an object against the force of gravity best judges an object's
A) mass.
B) weight.
C) both the same
D) none of the above
Answer: B
Diff: 1
Objective: 2.3

23) A kilogram is a measure of
A) mass.
B) weight.
C) both the same
D) none of the above
Answer: A
Diff: 1
Objective: 2.3

24) The quantity that best relates to the size of an object is
A) mass.
B) weight.
C) volume.
D) none of the above
Answer: C
Diff: 1
Objective: 2.3

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25) A heavy ball hangs by a string, with a second string attached to its bottom (Figure 2.7 in your textbook). A quick pull on the bottom string breaks the
A) top string.
B) bottom string.
C) top or bottom string equally likely.
D) none of the above
Answer: B
Diff: 2
Objective: 2.3

26) A heavy ball suspended by a string has a second string attached to its bottom (Figure 2.7 in your textbook). A slow pull on the bottom string breaks the
A) top string.
B) bottom string.
C) top or bottom string equally likely.
D) none of the above
Answer: A
Diff: 2
Objective: 2.3

27) When the lower string is pulled slowly in the heavy-ball-and-strings demonstration (Figure 2.7 in your textbook), tension
A) in the top string is due to your pull plus the weight of the ball.
B) is about the same in both strings.
C) in the bottom string is zero.
D) none of the above
Answer: A
Diff: 2
Objective: 2.3

28) Compared with a 2-kg block of solid iron, a 4-kg block of solid iron has twice as much
A) inertia.
B) mass.
C) volume.
D) all of the above
E) none of the above
Answer: D
Diff: 2
Objective: 2.3

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29) Compared with a 2-kg block of solid iron, a 4-kg block of solid iron has the same
A) mass.
B) volume.
C) weight.
D) none of the above
Answer: D
Diff: 2
Objective: 2.3

30) An object having twice as much mass as another object also has twice as much
A) inertia.
B) velocity.
C) gravitational acceleration.
D) volume.
Answer: A
Diff: 2
Objective: 2.3

31) Compared with an apple's mass on Earth, the mass of the same apple on the Moon is
A) less.
B) more.
C) the same.
D) none of the above
Answer: C
Diff: 2
Objective: 2.3

32) Your weight is
A) another word for your mass.
B) the gravitational attraction between you and Earth.
C) a property of mechanical equilibrium.
D) the same in all locations.
Answer: B
Diff: 1
Objective: 2.3

33) The weight of a 10-kg mass at Earth's surface is about
A) 1 N.
B) 5 N.
C) 10 N.
D) 100 N.
Answer: D
Diff: 2
Objective: 2.3

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34) A chunk of gold weighs 2 N on Earth. On the Moon, its weight would be
A) less.
B) the same.
C) more.
D) none of the above
Answer: A
Diff: 2
Objective: 2.3

35) A rubber ball weighs 1.5 N on Earth. Another kind of ball weighs 1.5 N on the Moon. The ball having the most mass is the
A) rubber ball.
B) other kind of ball.
C) same for each
D) not enough information
Answer: B
Diff: 3
Objective: 2.3

36) The net force acting on an object is
A) most often its weight.
B) the combination of all forces acting on it.
C) the force of friction acting on it.
D) none of the above
Answer: B
Diff: 1
Objective: 2.4

37) A cart is pushed to the right by a 10-N force. At the same time, a boy pushes it to the left with a 5-N force. The net force exerted on the cart is
A) 5 N to the left.
B) 5 N to the right.
C) 10 N to the left.
D) 10 N to the right.
Answer: B
Diff: 1
Objective: 2.4

38) When a 100-kg block is simultaneously pushed toward the east with 200 N and toward the west with 150 N, the combination of these forces on the block is
A) 50 N west.
B) 50 N east.
C) 350 N east
D) 350 N west.
Answer: B
Diff: 2
Objective: 2.4

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39) An object is pulled by three forces: 200 N to the right, 400 N to the right, and the third at 300 N to the left. The net force is
A) 600 N to the right.
B) 600 N to the left.
C) 300 N to the left.
D) none of the above
Answer: D
Diff: 2
Objective: 2.4

40) A 500-N object falling in air encounters 300 N of air resistance. The net force on the falling object is
A) 0 N.
B) 200 N.
C) 500 N.
D) 800 N.
Answer: B
Diff: 2
Objective: 2.4

41) A 100-N falling object encounters 40 N of air resistance. The net force on it is
A) 0 N.
B) 40 N.
C) 60 N.
D) 100 N.
Answer: C
Diff: 2
Objective: 2.4

42) A 100-N falling object encounters 100 N of air resistance. The net force on it is
A) 0 N.
B) 40 N.
C) 60 N.
D) 100 N.
Answer: A
Diff: 2
Objective: 2.4

43) A force of 100 N and one of 150 N act horizontally on a block. The net force is
A) definitely 50 N.
B) definitely 250 N.
C) either 50 N or 250 N.
D) between 0 N and 250 N.
Answer: C
Diff: 2
Objective: 2.4

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44) The equilibrium rule, $\Sigma F = 0$, applies to
A) objects or systems at rest.
B) objects or systems in uniform motion in a straight line.
C) both of the above
D) none of the above
Answer: C
Diff: 1
Objective: 2.5

45) Which object has zero acceleration?
A) An object at rest
B) An object moving at constant velocity
C) An object in mechanical equilibrium
D) all of the above
Answer: D
Diff: 1
Objective: 2.5

46) When the net force on an object equals zero, its acceleration
A) may be zero.
B) is zero.
C) and velocity are the same.
D) none of the above
Answer: B
Diff: 1
Objective: 2.5

47) According to the equilibrium rule, the vector sum of all forces acting on a
A) body at rest is zero.
B) body in uniform motion is zero.
C) non-accelerating body is zero.
D) all of the above
Answer: D
Diff: 1
Objective: 2.5

48) The expression $\Sigma F = 0$
A) is a vector quantity.
B) expresses equilibrium.
C) tells us that acceleration is zero.
D) all of the above
Answer: D
Diff: 1
Objective: 2.5

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49) When a 100-N object is suspended at rest by two equally taut vertical strands of rope, the tension in each strand is
A) less than 50 N.
B) 50 N.
C) more than 50 N.
D) 100 N.
Answer: B
Diff: 1
Objective: 2.5

50) Nellie Newton hangs suspended at rest by two ends of a rope draped over a large pulley. The tension in each strand equals
A) her weight.
B) half her weight.
C) more than half her weight.
D) none of the above
Answer: B
Diff: 2
Objective: 2.5

51) The tensions in each of the two supporting ropes that support Burl and Paul on opposite ends of a scaffold
A) are equal.
B) depend on the relative weights of Burl and Paul.
C) combine to equal zero.
D) none of the above
Answer: B
Diff: 2
Objective: 2.5

52) When Burl and Paul on a sign-painting scaffold are in equilibrium, the net upward supporting force of the vertical ropes is
A) equal to their weights.
B) greater than their weights.
C) equal and opposite to the combined weights of Burl, Paul, and the scaffold.
D) none of the above
Answer: C
Diff: 2
Objective: 2.5

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53) Burl carries Paul piggyback while standing in the MIDDLE of a scaffold. The tensions in the two supporting ropes
A) cancel to zero.
B) are equal.
C) are unequal.
D) more easily support Burl and Paul.
Answer: B
Diff: 2
Objective: 2.5

54) Burl and Paul have a total weight of 1300 N. The tensions in the supporting ropes of the scaffold they stand on add to 1700 N. The weight of the scaffold itself must be
A) 400 N.
B) 500 N.
C) 600 N.
D) 800 N.
Answer: A
Diff: 3
Objective: 2.5

55) If an object has no acceleration of any kind, then we can say for certain that it is
A) at rest.
B) moving at constant nonzero velocity.
C) in mechanical equilibrium.
D) all of the above
Answer: C
Diff: 2
Objective: 2.5

56) The frictional force on a sliding object is 500 N. The applied force needed to maintain a constant velocity is
A) more than 500 N.
B) less than 500 N.
C) 500 N.
D) none of the above
Answer: C
Diff: 1
Objective: 2.5

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57) A container of cement at a construction site is raised by a rope at constant speed. Compared with the force of gravity on the container, the upward force supplied by the rope is
A) greater.
B) equal.
C) less.
D) none of the above
Answer: B
Diff: 2
Objective: 2.5

58) A crate sliding down an incline at a constant velocity is
A) in dynamic equilibrium.
B) not in dynamic equilibrium.
C) in a state of being in and out of dynamic equilibrium.
D) none of the above
Answer: A
Diff: 2
Objective: 2.5

59) A skydiver who falls at constant velocity is in a state of
A) dynamic equilibrium.
B) non-dynamic equilibrium.
C) being in and out of dynamic equilibrium.
D) none of the above
Answer: A
Diff: 2
Objective: 2.5

60) The support force acting on a 9-N book resting on a horizontal surface is
A) less than 9 N.
B) 9 N.
C) greater than 9 N.
D) dependent on the position of the book.
Answer: B
Diff: 1
Objective: 2.6

61) Dad stands at rest on a kitchen floor. When son Hudson is given a piggyback, the support force beneath Dad
A) decreases.
B) remains constant.
C) increases.
D) none of the above
Answer: C
Diff: 1
Objective: 2.6

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62) Daisy weighs 150 N and carries a puppy who weighs 50 N on her back. The support force on Daisy's feet is
A) 50 N.
B) 150 N.
C) 200 N.
D) more than 200 N.
Answer: C
Diff: 2
Objective: 2.6

63) An empty jug of weight W rests on a table. Water of weight w is then poured into it. The support force supplied by the table is
A) W.
B) $W + w$.
C) $W — w$.
D) none of the above
Answer: B
Diff: 2
Objective: 2.6

64) Hudson stands at rest on a pair of bathroom scales. The scale readings will ALWAYS
A) each be half his weight.
B) each equal his weight.
C) add to equal his weight.
D) add up to more than his weight.
Answer: C
Diff: 2
Objective: 2.6

65) When Nellie is suspended at rest by a pair of gymnastic rings, the upward support forces by the rings will ALWAYS
A) each be half her weight.
B) each be equal to her weight.
C) add up to equal her weight.
D) add up to more than her weight.
Answer: C
Diff: 2
Objective: 2.6

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66) A 800-N man stands at rest with his weight evenly distributed on a pair of weighing scales. The reading on each scale is
A) 200 N.
B) 400 N.
C) 800 N.
D) 1600 N.
Answer: B
Diff: 2
Objective: 2.6

67) Jean, who weighs 800 N, stands at rest on two bathroom scales in such a way that one scale reads 500 N. The other scale reads
A) 200 N.
B) 300 N.
C) 400 N.
D) 800 N.
E) none of the above
Answer: B
Diff: 2
Objective: 2.6

68) As Marie jumps up and down on a floor, the support force by the floor
A) remains constant.
B) varies.
C) distributes unevenly.
D) none of the above
Answer: B
Diff: 2
Objective: 2.6

69) The force with which you press downward on a heavy coiled spring
A) is equal to the force pressing back on you.
B) partially equals the force pressing back on you.
C) can be greater than the force pressing back on you.
D) none of the above
Answer: A
Diff: 2
Objective: 2.6

70) As Marie pushes a table to the right, friction between the floor and the table acts toward
A) the left.
B) the right.
C) right angles to her push.
D) none of the above
Answer: A
Diff: 1
Objective: 2.7

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71) The pair of friction forces between one object and another act
A) in the same direction.
B) in opposite directions.
C) at right angles to each other.
D) none of the above
Answer: B
Diff: 1
Objective: 2.7

72) The amount of friction acting when two blocks slide against each other depends on
A) how much they are pressed together.
B) the "stickiness" of atoms on their surfaces.
C) the kinds of material being pressed.
D) all of the above
Answer: D
Diff: 1
Objective: 2.7

73) When Joan pushes a crate across a level floor at constant velocity, friction between the crate and the floor is
A) less than her pushing force.
B) the same amount as her pushing force.
C) more than her pushing force.
D) none of the above
Answer: B
Diff: 1
Objective: 2.7

74) A 2000-N bear grasping a vertical tree slides down at constant velocity. The friction force between the tree and the bear is
A) 20 N.
B) 200 N.
C) 2000 N.
D) more than 2000 N.
Answer: C
Diff: 2
Objective: 2.7

75) A crate is at rest on a horizontal floor. The friction force acting on the crate is
A) zero.
B) equal to the weight of the crate.
C) between zero and the weight of the crate.
D) none of the above
Answer: A
Diff: 2
Objective: 2.7

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76) If Marie pushes horizontally on a table, but not hard enough to get it moving, the friction force acting on the table is
A) zero.
B) equal to the weight of the table.
C) equal and opposite to her push.
D) none of the above
Answer: C
Diff: 3
Objective: 2.7

77) To move a crate across your basement floor, friction will be less if you
A) pull with a rope making an upward angle.
B) push with a stick at a downward angle.
C) both the same
D) not enough information
Answer: A
Diff: 2
Objective: 2.7

78) Friction is at play in
A) meteors.
B) many sports.
C) earthquakes.
D) all of the above
Answer: D
Diff: 1
Objective: IS 2.A

79) Friction is common in
A) solids.
B) liquids.
C) gases.
D) all of the above
Answer: D
Diff: 1
Objective: IS 2.A

80) Tristan steadily holds a brick by horizontally pressing his hands against the sides of the brick. Compared to the weight of the brick, the minimum combined forces of friction are
A) less.
B) equal.
C) greater.
D) any of these
Answer: B
Diff: 1
Objective: IS 2.A

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81) A rock climber is at rest by clinging her hands and feet to a sheer rock surface. The combined forces of friction acting on her
A) exceed her weight.
B) equal her weight.
C) are less than her weight.
D) not enough information
Answer: B
Diff: 1
Objective: IS 2.A

82) Two measurements that are necessary for calculating average speed are
A) acceleration and time.
B) velocity and time.
C) distance and time.
D) distance and acceleration.
Answer: C
Diff: 1
Objective: 2.8

83) What Aristotle overlooked about motion, but was incorporated by Galileo, was the role of
A) distance.
B) time.
C) space.
D) none of the above
Answer: B
Diff: 1
Objective: 2.8

84) Instantaneous velocity is
A) the velocity at any instant.
B) what a speedometer reads.
C) a vector quantity.
D) all the above
Answer: D
Diff: 1
Objective: 2.8

85) A glance at the speedometer in a vehicle will tell you your
A) average speed.
B) instantaneous speed.
C) overall speed.
D) acceleration.
Answer: B
Diff: 1
Objective: 2.8

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86) A freely falling object has an instantaneous speed of 10 m/s. One second later its speed will be
A) 10 m/s.
B) 20 m/s.
C) 30 m/s.
D) more than 30 m/s.
Answer: B
Diff: 1
Objective: 2.8

87) A freely falling object has an acceleration of 10 m/s^2. One second later its acceleration will be
A) 10 m/s^2.
B) 20 m/s^2.
C) 30 m/s^2.
D) more than 30 m/s^2.
Answer: A
Diff: 1
Objective: 2.8

88) When Mike sprints 100 yards in 20 seconds, his average running speed is
A) 1/2 yard/second.
B) 5 yards/second.
C) 50 yards/second.
D) not enough information
Answer: B
Diff: 2
Objective: 2.8

89) A horse gallops 10 km in 30 min with an average speed of
A) 10 km/h.
B) 20 km/h.
C) 30 km/h.
D) more than 30 km/h.
Answer: B
Diff: 2
Objective: 2.8

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90) A mosquito flying at 2 m/s encounters a 2-m/s breeze blowing in the same direction, giving it a resulting speed over the ground of
A) 0 m/s.
B) 2 m/s.
C) 4 m/s.
D) 6 m/s.
Answer: C
Diff: 2
Objective: 2.8

91) A mosquito flying at 2 m/s encounters a 2-m/s breeze blowing in the opposite direction, giving it a resulting speed over the ground of
A) 0 m/s.
B) 3 m/s.
C) 4 m/s.
D) 6 m/s.
Answer: A
Diff: 2
Objective: 2.8

92) When you're at rest on a hammock while a 2-m/s breeze is blowing. A hungry mosquito sees you as lunch and to join you for lunch, should first hover over you by flying
A) against the breeze at 2 m/s.
B) with the breeze at 2 m/s.
C) a bit faster than wind speed.
D) none of the above
Answer: A
Diff: 2
Objective: 2.8

93) You're napping on the sand while a breeze blows by at 1 m/s. If a pesky sandflea wishes to land on you, it should hover over you while flying
A) about 2 m/s relative to the breeze.
B) with the breeze at 1 m/s.
C) against the breeze at 1 m/s.
D) faster than 1 m/s but less than 2 m/s.
Answer: C
Diff: 2
Objective: 2.8

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94) You look down from the window of an airplane flying at 100 km/h and spot another airplane flying at the same speed in the opposite direction. Relative to you, the speed of the spotted plane is
A) zero.
B) 100 km/h.
C) 150 km/h.
D) 200 km/h.
Answer: D
Diff: 2
Objective: 2.8

95) In a moment of dozing while driving in a car at 50 km/h, you bump into a car ahead traveling at 48 km/h in the same direction. The speed of impact is
A) zero.
B) 2 km/h.
C) 48 km/h.
D) 50 km/h.
E) 98 km/h.
Answer: B
Diff: 2
Objective: 2.8

96) In a dream you're in a car traveling at 50 km/h when you crash into another car traveling toward you at 48 km/h, resulting in a speed of impact of
A) 48 km/h.
B) 50 km/h.
C) 98 km/h.
D) 2400 km/h.
Answer: C
Diff: 2
Objective: 2.8

97) The average speed of a ball rolling along a horizontal track will be increased if the track
A) has a hump along it.
B) has a dip along it.
C) both of these
D) not enough information
Answer: B
Diff: 2
Objective: 2.8

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98) Phil paddles his canoe at 8 m/s in still water. Keeping this speed he then paddles upstream in a river that flows downstream at 6 m/s. To his friend sitting on shore, Phil's speed is
A) 2 m/s.
B) 6 m/s.
C) 8 m/s.
D) 10 m/s.
Answer: A
Diff: 2
Objective: 2.8

99) Daisy's average speed when running a distance of 2 km in one-half hour is
A) 1 km/h.
B) 2 km/h.
C) 4 km/h.
D) more than 4 km/h.
Answer: C
Diff: 2
Objective: 2.8

100) If Jane walks a distance of 1 km in one-half hour, her average speed is
A) nearly 1 km/h.
B) 1 km/h.
C) slightly more than 1 km/h.
D) 2 km/h.
Answer: D
Diff: 2
Objective: 2.8

101) Neglecting air resistance, after a ball leaves your hand when you toss it upward, the force of your hand on the ball
A) no longer acts on the ball.
B) gradually decreases until moving sufficiently upward.
C) lingers very briefly.
D) none of the above
Answer: C
Diff: 2
Objective: 2.8

102) The concepts of velocity and acceleration are
A) different names for the same idea.
B) very different from each other.
C) concepts developed by Aristotle.
D) none of the above
Answer: B
Diff: 1
Objective: 2.9

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103) Your study buddy will be correct in saying that velocity and acceleration are
A) the same concept, but expressed differently.
B) rates of one another.
C) expressions for changing speeds.
D) different concepts.
Answer: D
Diff: 1
Objective: 2.9

104) An object accelerates when it
A) speeds up.
B) slows down.
C) changes its direction of motion.
D) all the above
Answer: D
Diff: 1
Objective: 2.9

105) When the speed of a ball increases by the same amount each second, its acceleration
A) also increases each second.
B) decreases each second.
C) is constant.
D) varies.
Answer: C
Diff: 1
Objective: 2.9

106) Which of these is a vector quantity?
A) Velocity
B) Acceleration
C) Force
D) all of the above
Answer: D
Diff: 1
Objective: 2.9

107) Acceleration is a measure of
A) how fast how-fast changes.
B) a change in velocity.
C) both of these
D) none of the above
Answer: C
Diff: 2
Objective: 2.9

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108) When a ball rolls down an inclined plane and gains 4 m/s each second of rolling, its acceleration is
A) one half of 4 m/s.
B) one half of 4 m/s^2.
C) 4 m/s^2.
D) 10 m/s^2.
Answer: C
Diff: 2
Objective: 2.9

109) A sports car that maintains a constant velocity of 120 km/h for one-half hour has an acceleration of
A) 60 km/h.
B) 120 km/h.
C) 240 km/h.
D) zero because of no change in velocity.
Answer: D
Diff: 2
Objective: 2.9

110) A motor scooter experiences acceleration when it
A) gains speed.
B) decreases speed.
C) changes direction.
D) all of the above.
Answer: D
Diff: 2
Objective: 2.9

111) An object in free fall experiences
A) increasing velocity.
B) increasing acceleration.
C) both of these
D) none of the above
Answer: A
Diff: 1
Objective: 2.9

112) During each second, the speed of an object in free fall
A) increases by the same amount.
B) changes by increasing amounts each second.
C) remains constant.
D) doubles each second.
Answer: A
Diff: 2
Objective: 2.9

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113) The gain in speed per second for a freely falling object is about
A) 0 m/s.
B) 5 m/s.
C) 10 m/s.
D) depends on the initial speed.
Answer: C
Diff: 2
Objective: 2.9

114) The acceleration of any falling object that gains a velocity of 10 m/s each second is
A) 10 m/s.
B) 10 m/s^2.
C) both of these
D) none of the above
Answer: B
Diff: 1
Objective: 2.9

115) At the end of 1/2 second, a skydiver freely falling from rest has a speed of
A) 1 m/s.
B) 5 m/s.
C) 10 m/s.
D) more than 10 m/s.
Answer: B
Diff: 2
Objective: 2.9

116) At the end of 2 seconds, a skydiver freely falling from rest has a speed of
A) 1 m/s.
B) 5 m/s.
C) 10 m/s.
D) more than 10 m/s.
Answer: D
Diff: 2
Objective: 2.9

117) Ten seconds after starting from rest, a skydiver in free fall has a speed of about
A) 10 m/s.
B) 50 m/s.
C) 100 m/s.
D) 500 m/s.
E) more than 500 m/s.
Answer: C
Diff: 1
Objective: 2.9

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118) Six seconds after starting from rest, a skydiver in free fall has a speed of
A) 10 m/s.
B) 30 m/s.
C) 60 m/s.
D) 70 m/s.
Answer: C
Diff: 2
Objective: 2.9

119) If a freely falling boulder were somehow equipped with a speedometer, its speed reading would increase each second by about
A) 5 m/s.
B) 10 m/s.
C) 15 m/s.
D) a variable amount.
Answer: B
Diff: 2
Objective: 2.9

120) A freely falling boulder has a speed of 40 m/s. One second later, its speed is
A) 10 m/s.
B) 30 m/s.
C) 40 m/s.
D) 50 m/s.
Answer: D
Diff: 2
Objective: 2.9

121) A freely falling boulder has a speed of 30 m/s at one instant. Exactly 2 seconds later, its speed will be
A) the same.
B) 40 m/s.
C) 50 m/s.
D) more than 50 m/s.
Answer: C
Diff: 2
Objective: 2.9

122) The acceleration of a block of ice sliding down an inclined ramp
A) is approximately constant.
B) increases with time.
C) decreases with time.
D) need more information
Answer: A
Diff: 2
Objective: 2.9

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123) A cart travels 5 m in 1 s, then 5 m again in 2 s, then another 5 m in the third second. The acceleration of the cart is
A) 0 m/s^2.
B) 5 m/s^2.
C) 10 m/s^2.
D) more than 10 m/s^2.
Answer: A
Diff: 2
Objective: 2.9

124) Toss a ball vertically upward and its speed at the top of its path is
A) zero.
B) 10 m/s^2.
C) between zero and 10 m/s^2.
D) dependent on the mass of the ball.
Answer: A
Diff: 1
Objective: 2.9

125) Toss a ball vertically upward and its acceleration at the top of its path is
A) zero.
B) 10 m/s^2.
C) between zero and 10 m/s^2.
D) dependent on the mass of the ball.
Answer: B
Diff: 3
Objective: 2.9

126) The acceleration of a scooter that maintains a CONSTANT VELOCITY of 15 m/s for 10 s is
A) 0 m/s^2
B) 0.15 m/s^2
C) 1.5 m/s^2
D) 15 m/s^2
Answer: A
Diff: 2
Objective: 2.9

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127) A ball tossed straight upward at 40 m/s, with no air resistance, returns to its starting point with a speed of
A) zero.
B) 10 m/s.
C) 40 m/s.
D) more than 40 m/s.
Answer: C
Diff: 2
Objective: 2.9

128) A ball is tossed straight upward at 40 m/s with no air resistance. One second before it reaches the top of its path its speed is
A) zero.
B) 10 m/s.
C) 20 m/s.
D) 30 m/s
Answer: B
Diff: 3
Objective: 2.9

129) A ball is tossed straight upward at 40 m/s with no air resistance. One second after it reaches the top of its path its speed is
A) zero.
B) 10 m/s.
C) 20 m/s.
D) 30 m/s
Answer: B
Diff: 2
Objective: 2.9

130) A ball is tossed straight upward at 40 m/s with no air resistance. Six seconds later its speed is
A) zero.
B) 10 m/s.
C) 20 m/s.
D) 30 m/s
Answer: C
Diff: 3
Objective: 2.9

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131) Consider a freely falling boulder equipped with a speedometer on a planet where the acceleration due to gravity is 20 m/s^2. In falling freely, its speed reading would increase each second by
A) 10 m/s.
B) 20 m/s.
C) 30 m/s.
D) depends on its initial speed
Answer: B
Diff: 3
Objective: 2.9

132) Mike stands at the edge of a cliff and throws one ball straight up and another ball straight down, both with the same speed. Neglecting air resistance, which ball hits the ground below with the greater speed?
A) The one thrown upward
B) The one thrown downward
C) neither, both hit with the same speed
D) need more information
Answer: C
Diff: 3
Objective: 2.9

133) Mike stands at the edge of a cliff and throws one ball straight up and another ball straight down, both with the same speed. Both balls hit the ground at
A) different speeds.
B) the same speed in the same time.
C) the same speed in different times.
D) none of the above
Answer: C
Diff: 3
Objective: 2.9

134) In measuring hang time, we assume that the time moving upward is
A) less than the time coming down.
B) equal to the time coming down.
C) more than the time coming down.
D) none of these
Answer: B
Diff: 2
Objective: IS 2.B

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135) From a standing jump, the vertical height reached by a basketball player who achieves a hang time of a full 1 s is about
A) 0.8 m.
B) 1 m.
C) 1.2 m.
D) 2.5 m.
Answer: C
Diff: 3
Objective: IS 2.B

136) Hang time on the surface of the Moon, where acceleration due to gravity is less, is
A) longer.
B) shorter.
C) the same as on Earth.
D) need more information
Answer: A
Diff: 3
Objective: IS 2.B

137) The hang time of an athlete who moves horizontally 2.0 m during a 1.25-m high jump is
A) less than 1 s.
B) about 1 s.
C) more than 1 s.
D) need more information
Answer: B
Diff: 2
Objective: IS 2.B

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