Fina exam revie sem 1

Multiple Choice
Identify the letter of the choice that best completes the statement or answers the question.

____ **1.** In the steps of the scientific method, what is the next step after formulating and objectively testing hypotheses?
a. interpreting results
b. stating conclusions
c. conducting experiments
d. making observations and collecting data

____ **2.** The symbol mm represents a
a. micrometer.
b. millimeter.
c. megameter.
d. manometer.

____ **3.** The SI base unit for time is
a. 1 day.
b. 1 hour.
c. 1 minute.
d. 1 second.

____ **4.** If some measurements agree closely with each other but differ widely from the actual value, these measurements are
a. neither precise nor accurate.
b. accurate but not precise.
c. acceptable as a new standard of accuracy.
d. precise but not accurate.

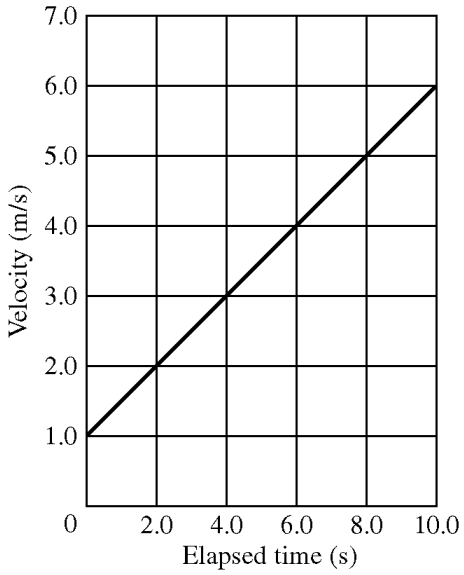
____ **5.** Five darts strike near the center of a target. The dart thrower is
a. accurate.
b. precise.
c. both accurate and precise.
d. neither accurate nor precise.

____ **6.** Calculate the following, and express the answer in scientific notation with the correct number of significant figures: $(0.82 + 0.042) \times (4.4 \times 10^3)$
a. 3.8×10^3
b. 3.78×10^3
c. 3.784×10^3
d. 3784

____ **7.** The Greek letter *sigma,* Σ, indicates a(n)
a. difference or change.
b. sum or total.
c. direct proportion.
d. inverse proportion

____ **8.** A dolphin swims 1.85 km/h. How far has the dolphin traveled after 0.60 h?
a. 1.1 km
b. 2.5 km
c. 0.63 km
d. 3.7 km

____ **9.** Which of the following is the expression for acceleration?
a. $a = \frac{\Delta t}{\Delta v}$
b. $a = \frac{\Delta v}{\Delta t}$
c. $a = \Delta t \bullet \Delta v$
d. $a = \frac{v_i - v_f}{t_i - t_f}$



____ **10.** What does the graph above illustrate about acceleration?
- **a.** The acceleration is constant.
- **b.** The acceleration is zero.
- **c.** The acceleration decreases.
- **d.** There is not enough information to answer.

____ **11.** A shopping cart given an initial velocity of 2.0 m/s undergoes a constant acceleration of 3.0 m/s^2. What is the magnitude of the cart's displacement after the first 4.0 s of its motion?
- **a.** 10.0 m
- **b.** 55 m
- **c.** 32 m
- **d.** 80.0 m

____ **12.** Acceleration due to gravity is also called
- **a.** negative velocity.
- **b.** displacement.
- **c.** free-fall acceleration.
- **d.** instantaneous velocity.

____ **13.** A rock is thrown straight upward with an initial velocity of 24.5 m/s where the downward acceleration due to gravity is 9.81 m/s^2. What is the rock's displacement after 1.00 s?
- **a.** 9.81 m
- **b.** 19.6 m
- **c.** 24.5 m
- **d.** 29.4 m

____ **14.** Which would fall with greater acceleration in a vacuum, a leaf or a stone?
- **a.** the leaf
- **b.** the stone
- **c.** They would accelerate at the same rate.
- **d.** It is difficult to determine without more information.

____ **15.** Identify the following quantities as scalar or vector: the mass of an object, the number of leaves on a tree, wind velocity.
- **a.** vector, scalar, scalar
- **b.** scalar, scalar, vector
- **c.** scalar, vector, scalar
- **d.** vector, scalar, vector

____ **16.** A lightning bug flies at a velocity of 0.25 m/s due east toward another lightning bug seen off in the distance. A light easterly breeze blows on the bug at a velocity of 0.25 m/s. What is the resultant velocity of the lightning bug?
- **a.** 0.50 m/s
- **b.** 0.00 m/s
- **c.** 0.75 m/s
- **d.** 0.25 m/s

____ **17.** An airplane flying at 120 km/h due west moves into a region where the wind is blowing at 40 km/h due east. If the plane's original vector velocity is $\mathbf{v}_{plane}$, which of the following is the correct expression for the plane's resulting velocity?

a. $\frac{2}{3}\mathbf{v}_{plane}$ **c.** $\frac{3}{4}\mathbf{v}_{plane}$

b. $-\frac{1}{3}\mathbf{v}_{plane}$ **d.** $-\frac{2}{3}\mathbf{v}_{plane}$

____ **18.** Which of the following is the best coordinate system to analyze a car traveling northeast from one city to another?

a. positive *x*-axis pointing east; positive *y*-axis pointing south
b. positive *x*-axis pointing west; positive *y*-axis pointing east
c. positive *x*-axis pointing north; positive *y*-axis pointing south
d. positive *x*-axis pointing east; positive *y*-axis pointing north

____ **19.** A duck waddles 2.5 m east and 6.0 m north. What are the magnitude and direction of the duck's displacement with respect to its original position?

a. 3.5 m at 19° north of east **c.** 6.5 m at 67° north of east
b. 6.3 m at 67° north of east **d.** 6.5 m at 72° north of east

____ **20.** Which of the following is an example of projectile motion?

a. a jet lifting off a runway
b. a bullet being fired from a gun
c. dropping an aluminum can into the recycling bin
d. a space shuttle orbiting Earth

____ **21.** Which of the following exhibits parabolic motion?

a. a person diving into a pool from a diving board
b. a space shuttle orbiting Earth
c. a leaf falling from a tree
d. a train moving along a flat track

____ **22.** A superhero flying at treetop level sees the Eiffel Tower elevator begin to free fall. If the superhero is 1.00 km away from the tower and the elevator falls from a height of 240.0 m, how long does the superhero have to save the people in the elevator? What should the superhero's average velocity be?

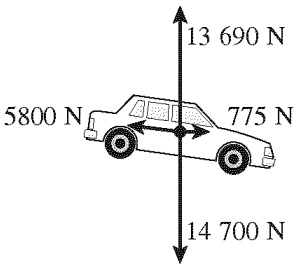
a. 7 s; 333 m/s **c.** 7 s; 143 m/s
b. 5 s; 200 m/s **d.** 9 s; 111 m/s

____ **23.** Which of the following statements does NOT describe force?

a. Force causes objects at rest to remain stationary.
b. Force causes objects to start moving.
c. Force causes objects to stop moving.
d. Force causes objects to change direction.

____ **24.** Which of the following forces exists between objects even in the absence of direct physical contact?

a. frictional force **c.** contact force
b. fundamental force **d.** field force



____ **25.** In the free-body diagram shown above, which of the following is the gravitational force acting on the car?

a. 5800 N
c. 14 700 N
b. 775 N
d. 13 690 N

____ **26.** A car goes forward along a level road at constant velocity. The additional force needed to bring the car into equilibrium is

a. greater than the normal force times the coefficient of static friction.
b. equal to the normal force times the coefficient of static friction.
c. the normal force times the coefficient of kinetic friction.
d. zero.

____ **27.** A trapeze artist weighs 8.00×10^2 N. The artist is momentarily held to one side of a swing by a partner so that both of the swing ropes are at an angle of 30.0° with the vertical. In such a condition of static equilibrium, what is the horizontal force being applied by the partner?

a. 924 N
c. 196 N
b. 433 N
d. 462 N

____ **28.** An airplane with a mass of 1.2×10^4 kg tows a glider with a mass of 0.60×10^4 kg. If the airplane propellers provide a net forward thrust of 3.6×10^4 N, what is the acceleration of the glider?

a. 2.0 m/s^2
c. 6.0 m/s^2
b. 3.0 m/s^2
d. 9.8 m/s^2

____ **29.** The statement by Newton that for every action there is an equal but opposite reaction is which of his laws of motion?

a. first
c. third
b. second
d. fourth

____ **30.** A measure of the quantity of matter is

a. density.
c. force.
b. weight.
d. mass.

____ **31.** An Olympic skier moving at 20.0 m/s down a 30.0° slope encounters a region of wet snow and slides 145 m before coming to a halt. What is the coefficient of friction between the skis and the snow?

a. 0.540
c. 0.116
b. 0.740
d. 0.470

____ **32.** Work is done when

a. the displacement is not zero.
b. the displacement is zero.
c. the force is zero.
d. the force and displacement are perpendicular.

____ **33.** A worker pushes a wheelbarrow with a horizontal force of 50.0 N over a level distance of 5.0 m. If a frictional force of 43 N acts on the wheelbarrow in a direction opposite to that of the worker, what net work is done on the wheelbarrow?

a. 250 J
c. 35 J
b. 0.0 J
d. 10.0 J

____ **34.** Which of the following energy forms is involved in a pencil falling from a desk?

a. kinetic energy
b. nonmechanical energy
c. gravitational potential energy
d. elastic potential energy and kinetic energy

____ **35.** What is the kinetic energy of a 0.135 kg baseball thrown at 40.0 m/s?

a. 54.0 J
c. 108 J
b. 87.0 J
d. 216 J

____ **36.** Which of the following energy forms is associated with an object due to its position relative to Earth?

a. potential energy
b. elastic potential energy
c. gravitational potential energy
d. kinetic energy

____ **37.** Which form of energy is involved in weighing fruit on a spring scale?
a. kinetic energy
b. nonmechanical energy
c. gravitational potential energy
d. elastic potential energy

____ **38.** A 0.002 kg coin, which has zero potential energy at rest, is dropped into a 10.0 m well. After the coin comes to a stop in the mud, what is its potential energy?
a. 0.000 J
b. 0.196 J
c. –0.196 J
d. 0.020 J

____ **39.** A 16.0 kg child on roller skates, initially at rest, rolls 2.0 m down an incline at an angle of 20.0° with the horizontal. If there is no friction between incline and skates, what is the kinetic energy of the child at the bottom of the incline? (g = 9.81 m/s^2.)
a. 210 J
b. 610 J
c. 11 J
d. 110 J

____ **40.** What is the average power supplied by a 60.0 kg secretary running up a flight of stairs rising vertically 4.0 m in 4.2 s?
a. 380 W
b. 560 W
c. 610 W
d. 670 W

____ **41.** If the distance from the center of a merry-go-round to the edge is 1.2 m, what centripetal acceleration does a passenger experience when the merry-go-round rotates at an angular speed of 0.5 rad/s?
a. 1.7 m/s^2
b. 0.9 m/s^2
c. 0.3 m/s^2
d. 0.6 m/s^2

____ **42.** The gravitational force between two masses is 36 N. What is the gravitational force if the distance between them is tripled? ($G = 6.673 \times 10^{-11}$ N•m^2/kg^2)
a. 4.0 N
b. 9.0 N
c. 18 N
d. 27 N

____ **43.** When a point on the rim of a 0.30-m-radius wheel experiences a centripetal acceleration of 4.0 m/s^2, what tangential acceleration does that point experience?
a. 1.2 m/s^2
b. 2.0 m/s^2
c. 4.0 m/s^2
d. 5.0 m/s^2
e. Cannot determine with the information given.

____ **44.** What centripetal force does an 80-kg passenger experience when seated 12 m from the center of a Ferris wheel whose angular speed is 0.50 rad/s?
a. 484 N
b. 720 N
c. 914 N
d. 240 N
e. 180 N

____ **45.** A 1 500-kg car rounds an unbanked curve with a radius of 52 m at a speed of 12 m/s. What minimum coefficient of friction must exist between the road and tires to prevent the car from slipping? (g = 9.8 m/s^2)
a. 0.18
b. 0.30
c. 0.28
d. 0.37
e. 0.42

____ **46.** Consider a child who is swinging. As she reaches the lowest point in her swing:
a. the tension in the rope is equal to her weight.

b. the tension in the rope is equal to her mass times her acceleration.
c. her acceleration is downward at 9.8 m/s^2.
d. none of the above.
e. both choices A and C are valid.

____ **47.** An object when orbiting the Earth at a height of three Earth radii from the center of the Earth has a weight of 1.00 N. What is the object's mass? (*g* at the surface of the Earth is 9.8 m/s^2)
a. 0.102 kg
b. 0.306 kg
c. 0.92 kg
d. 1.0 kg
e. 1.4 kg

Fina exam revie sem 1
Answer Section

MULTIPLE CHOICE

1.	ANS:	A	PTS: 1	DIF:	I	OBJ:	1-1.2
2.	ANS:	B	PTS: 1	DIF:	I	OBJ:	1-2.1
3.	ANS:	D	PTS: 1	DIF:	I	OBJ:	1-2.1
4.	ANS:	D	PTS: 1	DIF:	I	OBJ:	1-2.3
5.	ANS:	C	PTS: 1	DIF:	II	OBJ:	1-2.3
6.	ANS:	A	PTS: 1	DIF:	IIIA	OBJ:	1-2.4
7.	ANS:	B	PTS: 1	DIF:	I	OBJ:	1-3.2
8.	ANS:	A	PTS: 1	DIF:	IIIA	OBJ:	2-1.2
9.	ANS:	B	PTS: 1	DIF:	I	OBJ:	2-2.1
10.	ANS:	A	PTS: 1	DIF:	II	OBJ:	2-2.2
11.	ANS:	C	PTS: 1	DIF:	IIIA	OBJ:	2-2.3
12.	ANS:	C	PTS: 1	DIF:	I	OBJ:	2-3.1
13.	ANS:	B	PTS: 1	DIF:	IIIB	OBJ:	2-3.2
14.	ANS:	C	PTS: 1	DIF:	I	OBJ:	2-3.3
15.	ANS:	B	PTS: 1	DIF:	II	OBJ:	3-1.1
16.	ANS:	B	PTS: 1	DIF:	II	OBJ:	3-1.2
17.	ANS:	A	PTS: 1	DIF:	IIIA	OBJ:	3-1.3
18.	ANS:	D	PTS: 1	DIF:	I	OBJ:	3-2.1
19.	ANS:	C	PTS: 1	DIF:	IIIB	OBJ:	3-2.2
20.	ANS:	B	PTS: 1	DIF:	I	OBJ:	3-3.1
21.	ANS:	A	PTS: 1	DIF:	I	OBJ:	3-3.2
22.	ANS:	C	PTS: 1	DIF:	IIIB	OBJ:	3-4.2
23.	ANS:	A	PTS: 1	DIF:	I	OBJ:	4-1.1
24.	ANS:	D	PTS: 1	DIF:	I	OBJ:	4-1.2
25.	ANS:	C	PTS: 1	DIF:	I	OBJ:	4-1.3
26.	ANS:	D	PTS: 1	DIF:	I	OBJ:	4-2.3
27.	ANS:	D	PTS: 1	DIF:	IIIB	OBJ:	4-2.3
28.	ANS:	A	PTS: 1	DIF:	IIIB	OBJ:	4-3.2
29.	ANS:	C	PTS: 1	DIF:	I	OBJ:	4-3.3
30.	ANS:	D	PTS: 1	DIF:	I	OBJ:	4-4.1
31.	ANS:	B	PTS: 1	DIF:	IIIC	OBJ:	4-4.4
32.	ANS:	A	PTS: 1	DIF:	I	OBJ:	5-1.2
33.	ANS:	C	PTS: 1	DIF:	IIIA	OBJ:	5-1.4
34.	ANS:	C	PTS: 1	DIF:	I	OBJ:	5-2.1
35.	ANS:	C	PTS: 1	DIF:	IIIA	OBJ:	5-2.2
36.	ANS:	C	PTS: 1	DIF:	I	OBJ:	5-2.4
37.	ANS:	D	PTS: 1	DIF:	I	OBJ:	5-2.4
38.	ANS:	C	PTS: 1	DIF:	IIIB	OBJ:	5-2.5
39.	ANS:	D	PTS: 1	DIF:	IIIA	OBJ:	5-3.3
40.	ANS:	B	PTS: 1	DIF:	IIIB	OBJ:	5-4.3
41.	ANS:	C	PTS: 1	DIF:	IIIB	OBJ:	7-2.3

42. ANS: A PTS: 1 DIF: IIIA OBJ: 7-3.3
43. ANS: E PTS: 1 DIF: 2 TOP: 7.4 Centripetal Acceleration
44. ANS: D PTS: 1 DIF: 2 TOP: 7.4 Centripetal Acceleration
45. ANS: C PTS: 1 DIF: 2 TOP: 7.4 Centripetal Acceleration
46. ANS: D PTS: 1 DIF: 2 TOP: 7.4 Centripetal Acceleration
47. ANS: C PTS: 1 DIF: 2 TOP: 7.5 Newtonian Gravitation