Name: _____ Class: _____ Date: _____ ID: A

# 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.

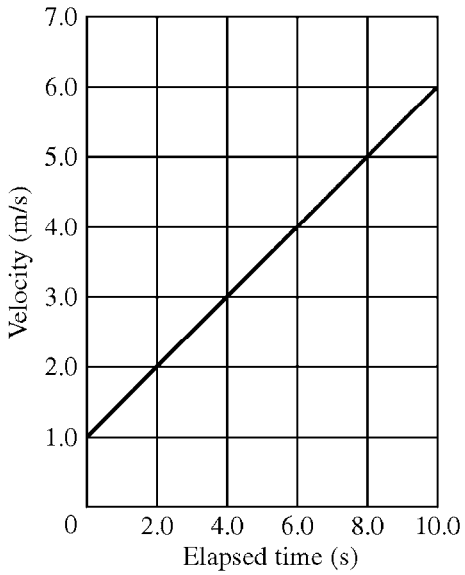
____ **5.** Five darts strike near the center of a target. The dart thrower is
**a.** accurate.
**b.** precise.
**c.** both accurate and precise.
**d.** neither accurate nor precise.

____ **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.** $3.8 \times 10^3$
**b.** $3.78 \times 10^3$
**c.** $3.784 \times 10^3$
**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 $\mathbf{v}_{\text{plane}}$, which of the following is the correct expression for the plane's resulting velocity?

**a.** $\frac{2}{3}\mathbf{v}_{\text{plane}}$
**c.** $\frac{3}{4}\mathbf{v}_{\text{plane}}$
**b.** $-\frac{1}{3}\mathbf{v}_{\text{plane}}$
**d.** $-\frac{2}{3}\mathbf{v}_{\text{plane}}$

____ **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?

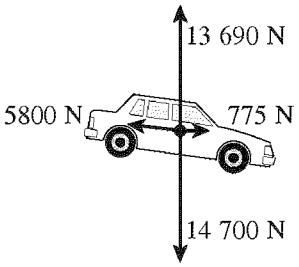
**a.** 7 s; 333 m/s
**c.** 7 s; 143 m/s
**b.** 5 s; 200 m/s
**d.** 9 s; 111 m/s

____ **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
**b.** 775 N
**c.** 14 700 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 $8.00 \times 10^2$ 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
**b.** 433 N
**c.** 196 N
**d.** 462 N

____ **28.** An airplane with a mass of $1.2 \times 10^4$ kg tows a glider with a mass of $0.60 \times 10^4$ kg. If the airplane propellers provide a net forward thrust of $3.6 \times 10^4$ N, what is the acceleration of the glider?
**a.** 2.0 m/s$^2$
**b.** 3.0 m/s$^2$
**c.** 6.0 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
**b.** second
**c.** third
**d.** fourth

____ **30.** A measure of the quantity of matter is
**a.** density.
**b.** weight.
**c.** force.
**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
**b.** 0.740
**c.** 0.116
**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
**b.** 0.0 J
**c.** 35 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
**b.** 87.0 J
**c.** 108 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.** Which of the following has the greatest momentum?
**a.** truck with a mass of 2250 kg moving at a velocity of 25 m/s
**b.** car with a mass of 1210 kg moving at a velocity of 51 m/s
**c.** truck with a mass of 6120 kg moving at a velocity of 10 m/s
**d.** car with a mass of 1540 kg moving at a velocity of 38 m/s

____ **42.** When comparing the momentum of two moving objects, which of the following is correct?
**a.** The object with the higher velocity will have less momentum if the masses are equal.
**b.** The more massive object will have less momentum if its velocity is greater.
**c.** The less massive object will have less momentum if the velocities are the same.
**d.** The more massive object will have less momentum if the velocities are the same.

____ **43.** The change in an object's momentum is equal to
**a.** the product of the mass of the object and the time interval.
**b.** the product of the force applied to the object and the time interval.
**c.** the time interval divided by the net external force.
**d.** the net external force divided by the time interval.

____ **44.** A 0.2 baseball if pitched with a velocity of 40 m/s and is then batted to the pitcher with a velocity of 60 m/s. What is the magnitude of change in the ball's momentum?

**a.** 4 kg•m/s
**b.** 8 kg•m/s
**c.** 2 kg•m/s
**d.** 20 kg•m/s

____ **45.** Which of the following statements properly relates the variables in the equation $\mathbf{F}\Delta t = \Delta\mathbf{p}$?

**a.** A large constant force changes an object's momentum over a long time interval.
**b.** A large constant force acting over a long time interval causes a large change in momentum.
**c.** A large constant force changes an object's momentum at various time intervals.
**d.** A large constant force does not necessarily cause a change in an object's momentum.

____ **46.** A large moving ball collides with a small stationary ball. The momentum

**a.** of the large ball decreases, and the momentum of the small ball increases.
**b.** of the small ball decreases, and the momentum of the large ball increases.
**c.** of the large ball increases, and the momentum of the small ball decreases.
**d.** does not change for either ball.

____ **47.** Two skaters stand facing each other. One skater's mass is 60 kg, and the other's mass is 72 kg. If the skaters push away from each other without spinning,

**a.** the 60 kg skater travels at a lower momentum.
**b.** their momenta are equal but opposite.
**c.** their total momentum doubles.
**d.** their total momentum decreases.

____ **48.** The law of conservation of momentum states that

**a.** the total initial momentum of all objects interacting with one another usually equals the total final momentum.
**b.** the total initial momentum of all objects interacting with one another does not equal the total final momentum.
**c.** the total momentum of all objects interacting with one another is zero.
**d.** the total momentum of all objects interacting with one another remains constant regardless of the nature of the forces between the objects.

____ **49.** Which of the following angles equals $2\pi$ rad?

**a.** 360°
**b.** 180°
**c.** 0°
**d.** 3.14°

____ **50.** Earth has an equatorial radius of approximately 6380 km, and it rotates 360° every 24 h. What is the angular displacement of a person standing at the equator for 3.0 h?

**a.** 0.26 rad
**b.** 0.52 rad
**c.** 0.78 rad
**d.** 0.39 rad

____ **51.** 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$^2$

____ **52.** 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

# Fina exam revie sem 1
## Answer Section

### MULTIPLE CHOICE

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

**41.** ANS: B DIF: IIIB OBJ: 6-1.1
**42.** ANS: C DIF: II OBJ: 6-1.1
**43.** ANS: B DIF: I OBJ: 6-1.3
**44.** ANS: D DIF: IIIB OBJ: 6-1.3
**45.** ANS: B DIF: I OBJ: 6-1.4
**46.** ANS: A DIF: II OBJ: 6-2.1
**47.** ANS: B DIF: II OBJ: 6-2.2
**48.** ANS: D DIF: I OBJ: 6-2.3
**49.** ANS: A DIF: I OBJ: 7-1.1
**50.** ANS: C DIF: IIIA OBJ: 7-1.2
**51.** ANS: C DIF: IIIB OBJ: 7-2.3
**52.** ANS: A DIF: IIIA OBJ: 7-3.3