Dynamics Review

Turn on your clickers!

- Please sync with the channel by pressing the appropriate letter and hitting “enter” which is the green arrow key!
- Try voting on which are the better of the four!

A. Pirates
B. Ninjas
C. Kittens
D. Kangaroos

Question 1

- Jimbo is standing on the ground. Which of the following force(s) is(are) exerted on Jimbo?
  - I Downward force of Earth on Jimbo
  - II Upward force exerted by the ground on Jimbo
  - III Downward force exerted by Jimbo on the ground
  - IV A net downward force due to air pressure.

A. I only
B. I and II
C. I, II, and III
D. I, II, and IV
E. None, since the Jimbo is at rest there are no forces exerted on him.

Question 2

- Tiny with mass of 90 kilograms is on rollerblades, he pushes his friend Big Earl also on rollerblades(45 kg). They both begin to roll apart. How does the force of Tiny on Big Earl compare to the force of Big Earl on Tiny when Tiny is still in contact with Big Earl?

A. Tiny exerts twice as much force on Big Earl as Big Earl on Tiny.

B. Tiny exerts a force on Big Earl since he is pushing, Big Earl does not exert a force on Tiny.

C. Big Earl exerts the same amount of force on Tiny as Tiny exerts on Big Earl.

D. Neither person exerts a force on each other.

Question 3

- A person is pushing a crate slowly at a constant velocity of 0.75 m/s. What can you conclude about the forces exerted on the crate?

A. If the force exerted on the crate is doubled, the speed will double to 1.5 m/s and then remain constant.

B. The force exerted by the person on the box must be greater than the force exerted by Earth on the box.

C. The force exerted by the person on the box must be equal to the force of friction that the surface exerts on the box.

D. The force exerted by the person on the box must be greater than the force the surface exerts on the box (friction).

Question 4

- Your friend Mikey says that if the person in the previous question stops pushing the crate, the crate will come to a complete stop immediately. Do you agree?

A. No, the box will continue to move at a constant pace.

B. Yes, the force of friction that the surface exerts on the box will cause it to stop instantly.

C. No, it will continue at a constant velocity for a few seconds after he stops pushing, then slow down to a stop.

D. No, it will immediately start slowing to a stop because it is in equilibrium.

E. Yes, it will immediately stop because it is in equilibrium.

F. No, it will immediately start slowing to a stop because the force of friction that the surface exerts on the box will be unbalanced and in the opposite direction of the crate's motion.

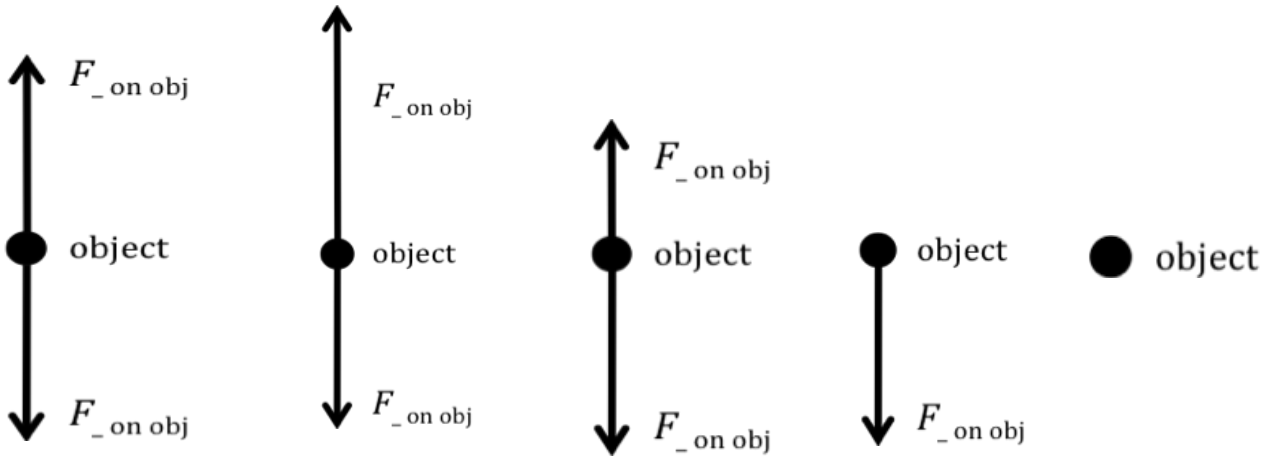
Question 5

- Tarzan is enjoying some downtime and is dropping into a cool refreshing pool from a vine. Describe the unbalanced force being exerted on Tarzan.

A. The unbalanced force is down and constant.
B. The unbalanced force is down and increasing.
C. The unbalanced force is down and decreasing.
D. The unbalanced force is zero.
E. None of these are correct.

Question 6

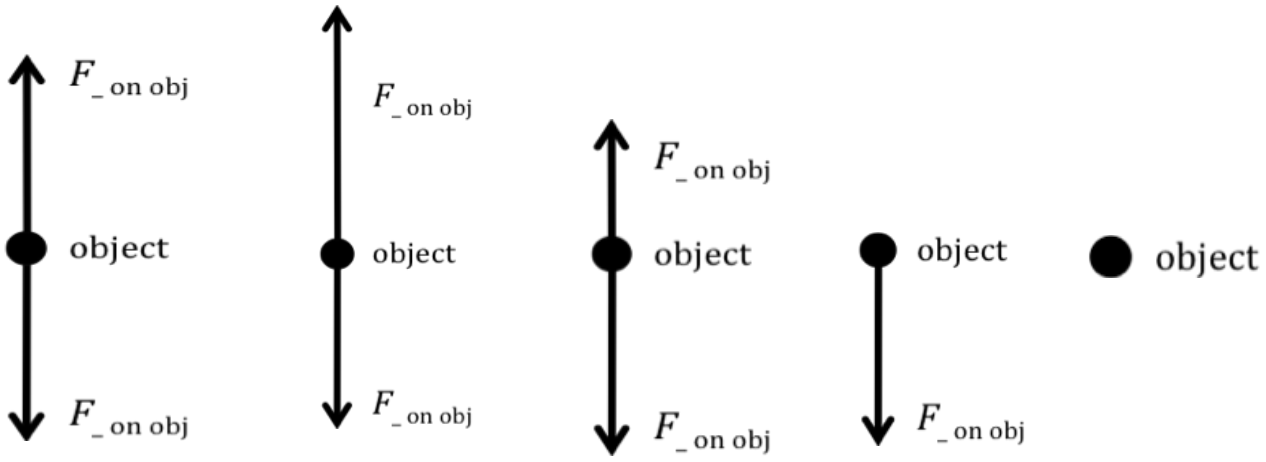
- Refer to the following force diagrams, choose which one fits the situation the best, the underlined object is the object of interest in the diagram:
  -A falling <u>bowling ball</u> is landing on a squishy couch. (it is already touching the couch cushion and slowing down)



A. B. C. D. E. F. None

Question 7

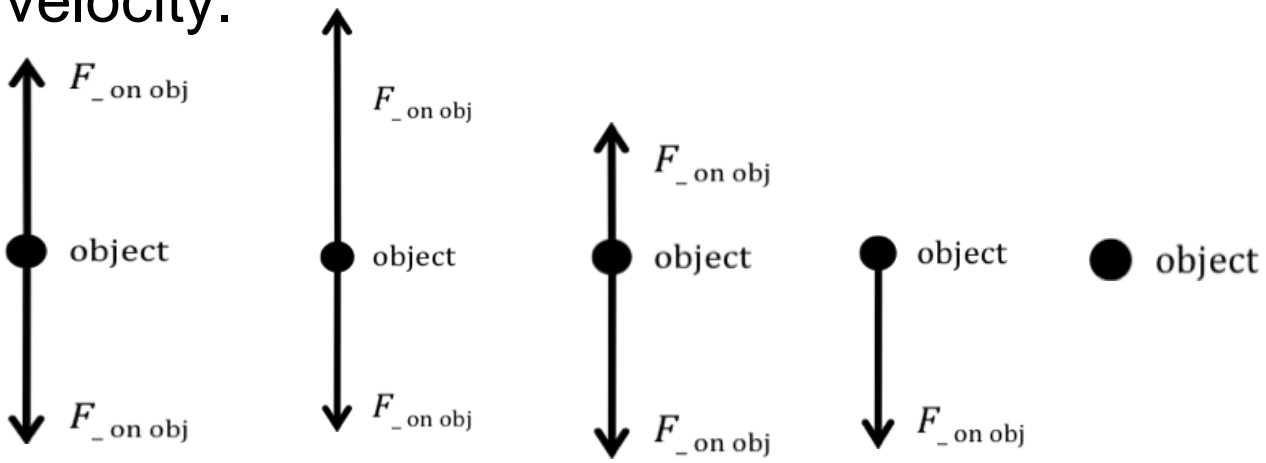
- Refer to the following force diagrams, choose which one fits the situation the best, the underlined object is the object of interest in the diagram:
  -You are struggling to hold a gigantic <u>big gulp</u> in your hand, it is at rest.



A. B. C. D. E. F. None

Question 8

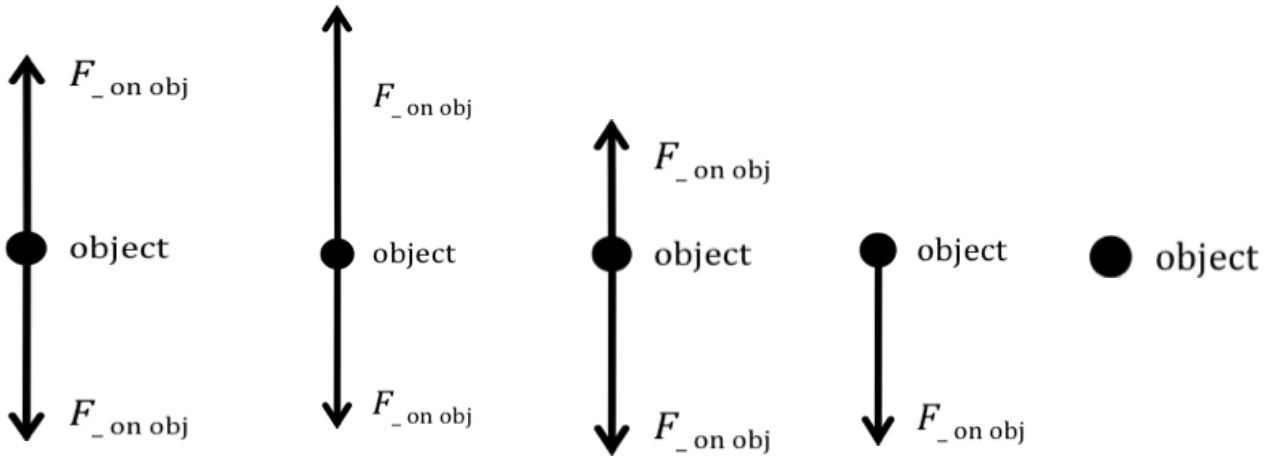
- Refer to the following force diagrams, choose which one fits the situation the best, the underlined object is the object of interest in the diagram:
  -A <u>comet</u> is hurtling through deep space at 1500 m/s. It is not near any other objects as it moves at a constant velocity.



A. B. C. D. E. F. None

Question 9

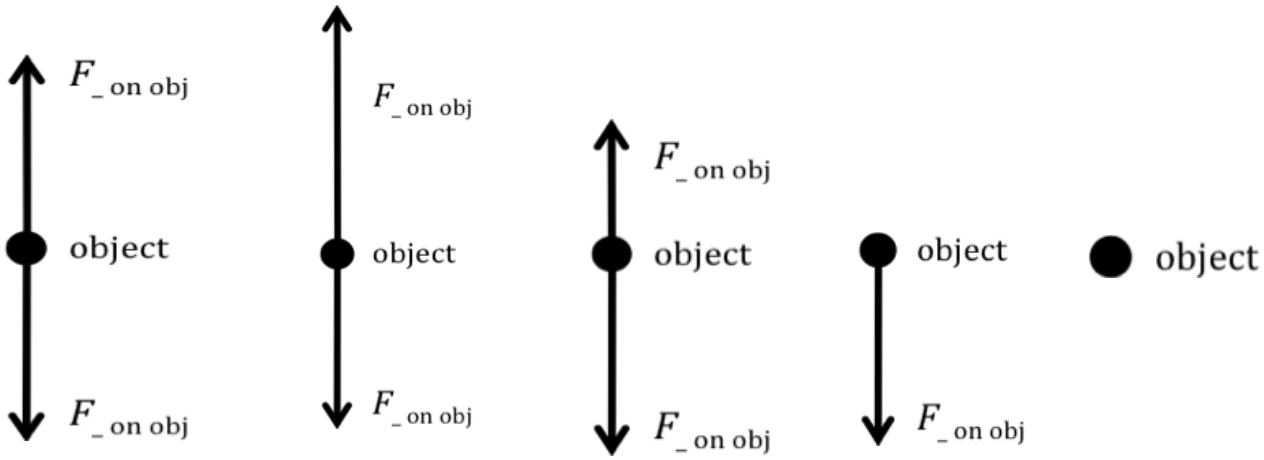
- Refer to the following force diagrams, choose which one fits the situation the best, the underlined object is the object of interest in the diagram:
  -An <u>elevator</u> is moving down at a constant speed.



A. B. C. D. E. F. None

Question 10

- Refer to the following force diagrams, choose which one fits the situation the best, the underlined object is the object of interest in the diagram:
  -An <u>elevator</u> is moving up at a constant speed.



A. B. C. D. E. F. None

Question 11

- The net force exerted on an object is equal to zero. (Sum of the forces exerted by other object on the system in each direction is zero.) Choose the best description of the sled's motion.

A. The object moves in the positive direction at a constant velocity.
B. The object is at rest.
C. The object moves in the negative direction at a constant velocity.
D. The object moves at a constant acceleration.
E. A through C are all possible.

Question 12

- A system has two forces being exerted on it by outside objects. One 30 N force exerted on the system is in the (+) x-direction. Another is a 15 N force on the system in the (-) x direction. If the system's mass is 3 kg. What is the acceleration in m/s^2?

  With your keypad please enter the numerical response.

Question 13

- An unbalanced force is being exerted on an object of mass m, it is accelerating. If the mass of the object doubles while the unbalanced force remains the same, what happens to the acceleration?

A. The acceleration doubles
B. The acceleration remains unchanged
C. The acceleration is halved
D. The acceleration is quartered.
E. The acceleration is quadrupled

Question 14

- An unbalanced force is being exerted on an object of mass m, it is accelerating. If the unbalanced force is quadrupled, and the object's mass stays the same, what happens to the acceleration?

A. The acceleration doubles
B. The acceleration remains unchanged
C. The acceleration is halved
D. The acceleration is quartered.
E. The acceleration is quadrupled

Question 15

- An unbalanced force is being exerted on an object of mass m, it is accelerating. If the unbalanced force is doubled, and the object's mass is doubled, what happens to the acceleration?

A. The acceleration doubles
B. The acceleration remains unchanged
C. The acceleration is halved
D. The acceleration is quartered.
E. The acceleration is quadrupled

Question 16

- There is a constant non-zero unbalanced force being exerted on an object. Describe the object's acceleration?

A. The acceleration is constantly increasing.
B. The acceleration is constantly decreasing.
C. The acceleration is constant.
D. The acceleration is zero.
E. You are unable to determine acceleration.

Question 17

- The mass of an object is 12 kg. It is sitting at rest on a flat, rough surface. The maximum force of static friction on the object is 60 N. What is the coefficient of static friction? (Assume that g = 10 N/m or m/s^2)

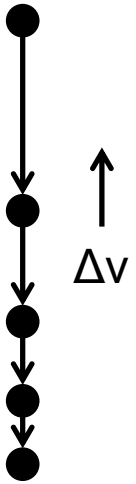
  With your keypad, please enter your numeric response.

Question 18

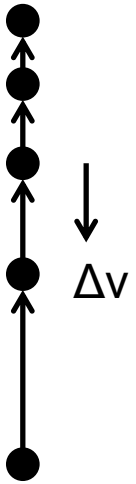
- Which motion diagram(s) match the force diagram? (up is positive, down is negative)

A.

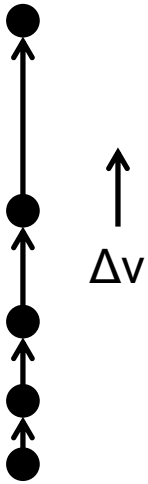
B.



C.



D.



E. (B and D)
F. (B and C)

Question 19

- A car is moving in the negative direction, and slowing down at a constant rate (acceleration is constant). Choose what force would keep this car moving as described.
  - A. The road exerts an unbalanced force on the car in the negative direction.
  - B. The road exerts an unbalanced force on the car in the positive direction.
  - C. The road exerts no force on the car at all.
  - D. The road exerts a force on the car, but the acceleration is constant so the object is in equilibrium.