Force Pressure Set

SHORT ANSWER. Write the word or phrase that best completes each statement or answers the question

1) In a particle accelerator, a proton reaches an acceleration of 9.0×10^{13} m/s^2. The mass of a proton is 1.7×10^{-27} kg. What is the force on the proton? 1) _____

2) On a hard stop, the deceleration of a car is 8.00 m/s^2. What force does a 50.0-kg passenger exert on the seat belt in such a stop? 2) _____

3) A flatbed truck is carrying a load of timber which is not tied down. The mass of the timber is 800 kg. The maximum frictional force between the truck bed and the load is 2400 N. What is the highest acceleration that the truck can have without losing its load? 3) _____

4) A 120-kg mass rests on a horizontal surface. What is the magnitude of the normal force exerted by the surface on the mass? 4) _____

5) A net force of 125 N is applied to a certain object. As a result, the object accelerates with an acceleration of 24.0 m/s^2. The mass of the object is 5) _____

6) A 777 aircraft has a mass of 300,000 kg. At a certain instant during its landing, its speed is 27.0 m/s. If the braking force is 445,000 N, what is the speed of the airplane 10.0 s later? 6) _____

7) A 777 aircraft has a mass of 300,000 kg. At a certain instant during its landing, its speed is 27.0 m/s. If the braking force is 435,000 N, how much further does it travel along the runway before it comes to a stop? 7) _____

8) What average net force is required to accelerate a car with a mass of 1200 kg from 0 to 27.0 m/s in 10.0 s? 8) _____

9) A net force of 450 N applied to a car results in the car accelerating at 0.360 m/s^2. What is the mass of the car? 9) _____

10) A catcher stops a ball traveling at 40 m/s in a distance of 20 cm and feels a force of 600 N against his glove. What is the mass of the ball? 10) _____

11) A 1200-kg car is pulling a 500-kg trailer along level ground. Friction is negligible. The car accelerates with an acceleration of 1.3 m/s^2. What is the force exerted by the car on the trailer? 11) _____

12) A person has a mass of 45 kg. How much does she weigh? 12) _____

13) A person has a mass of 45 kg. How much does she weigh on the Moon, where g = 1.62 m/s^2? 13) _____

14) An astronaut weighs 99.0 N on the Moon, where the acceleration of gravity is 1.62 m/s^2. How much does she weigh on Earth? 14) _____

15) A 40.0-kg crate is being lowered by means of a rope. Its downward acceleration is 2.00 m/s^2. What is the force exerted by the rope on the crate? 15) _____

16) A 40.0-kg crate is being raised by means of a rope. Its upward acceleration is 2.00 m/s^2. What is the force exerted by the rope on the crate? 16) _____

17) A 36.0-kg child steps on a scale in an elevator. The scale reads 400 N. What is the magnitude of the acceleration of the elevator? 17) _____

18) A 45-kg person steps on a scale in an elevator. The scale reads 460 N. What is the elevator doing? 18) _____

19) A 47.0-kg person steps on a scale in an elevator. The scale reads 461 N. What is the elevator doing? 19) _____

20) In the absence of an external force, a moving object will 20) _____

21) An object is moving with constant velocity. Which of the following statements is true? 21) _____

22) A constant net force acts on an object. Describe the motion of the object 22) _____

23) You apply the same force to two objects. Object 1 has mass M and object 2 has mass $5M$. The acceleration of object 2 is 23) _____

24) A 20-ton truck collides with a 1500-lb car and causes a lot of damage to the car. Since a lot of damage is done on the car 24) _____

25) A truck is towing a car whose mass is one quarter that of the truck. The force exerted by the truck on the car is 6000 N. The force exerted by the car on the truck is 25) _____

26) A golf club hits a golf ball with a force of 2400 N. The golf ball hits the club with a force 26) _____

27) A fireman is sliding down a fire pole. As he speeds up, he tightens his grip on the pole thus increasing the vertical frictional force that the pole exerts on the fireman. When this force equals the weight of the fireman, what happens? 27) _____

28) You ride on an elevator that is moving with constant downward acceleration while standing on a bathroom scale. The reading on the scale is 28) _____

TRUE/FALSE. Write 'T' if the statement is true and 'F' if the statement is false

29) Mass is a measure of how difficult it is to change the velocity of an object 29) _____

30) An object always moves in the direction of the net force pushing on it 30) _____

31) The acceleration of an object does not have to be in the same direction as the net force applied to it 31) _____

32) The mass of an object is fixed, but its weight varies from location to location 32) _____

1) 1.5×10^{-13} N
2) 400 N
3) 3.00 m/s^2
4) 1180 N
5) 5.20 kg.
6) 12.2 m/s
7) 251 m
8) 3240 N
9) 1250 kg
10) 0.15 kg
11) 650 N
12) 440 N
13) 73 N
14) 600 N
15) 312 N
16) 472 N
17) 0.969 m/s^2
18) It is accelerating upward at 0.41 m/s^2.
19) It is either at rest or traveling with a constant velocity.
20) move with constant velocity.
21) The net force on the object is zero.
22) constant non-zero acceleration.
23) one-fifth as that of object 1.
24) the force on the truck is equal to the force on the car
25) 6000 N.
26) exactly 2400 N.
27) The fireman continues to descend, but with constant speed
28) less than your true weight, mg.
29) TRUE
30) FALSE
31) FALSE
32) TRUE