Phys11 Newton's Laws : W.S. - 30

1) What is the weight of a 5.0 kg object?

2) Find the mass of an object that weighs -70. N (on Earth)

3) What is the force of gravity on an 8.00 kg object that is set on a table? What is the force of the table on the object?

4) If a 12.0 kg object sits on a table, what is the net force on the object?

5) A force of 25 N acts on an object of mass 10. kg. Find the acceleration.

6) A mass of 12 kg is accelerated at -3.0 m/s^2. Find the force.

7) A force of 5.0 N [right] acts on an object. Friction is 1.5 N [left] The mass of the object is 7.0 kg. Find the acceleration.

8) A 1000. kg car goes from 10. m/s to 20. m/s in 5.0 s. Find the force.

9) A 2500.0 kg plane flies at a constant speed of 80. km/hr. Find the net force.

10) The brakes of a 1.0x10^3 kg car exert a force of -3.0x10^3 N. How many seconds will it take the car to come to a stop from a velocity of 30. m/s?

11) How much force is required to bring a 1500. kg truck from rest to a velocity of 6.0 m/s in 10. s?

12) An object of mass 15 kg falls to the ground. The air resistance is 35N [up]. Find the acceleration.

13) An object is suspended by a cable. The object has mass of 7.0 kg. Find the tension in the cable.

14) An elevator has a mass of 1500 kg. It is supported by a cable with a maximum safe tension of 2.0x10^4 N. What is the maximum upward acceleration?

15) Two masses of 5.0 kg and 3.0 kg are suspended by rope from either side of a frictionless pulley. Find the tension and acceleration.

16) How much upward force is required to move a 15 kg object up at a constant velocity of 2.0 m/s?

17) How much upward force is required to move a 15 kg object up at an acceleration of 3.0 m/s^2.

18) What force is required to accelerate a 6.0 kg object downward on Earth with an acceleration of -15 m/s^2?

19) An 8.0 kg rifle fires a bullet of mass 2.0 grams out the barrel at 1500 m/s in 0.0010 s. Find the force on the bullet. Find the force on the gun. Find the acceleration of the bullet. Find the initial acceleration of the gun.

20) The space shuttle has a mass of 1.0x10^5 kg. The velocity is a constant 7.9 km/s, at an altitude of 100. km. Find the force on the shuttle. (use $g_1/g_2 = d_2^2/d_1^2$ and Earth's radius equals 6400 km).

21) A 2.0 kg mass slides down a frictionless incline of 30. degrees. Find the acceleration.

22) A 3.0 kg box is pulled by a force of 20. N. A second box with a mass of 2.0 kg is connected by a string to the first box. Find the tension in the string. There is no friction.

Answers : 1) 49N [down], 2) 7.1 kg, 3) -78 N, +78 N, 4) 0.0 N, 5) 2.5 m/s^2, 6) -36 N, 7) 0.50 m/s^2, 8) 2.0x10^3 N, 9) 0.0 N, 10) 10. s, 11) 9.0x10^2 N, 12) -7.5 m/s^2, 13) 69 N, 14) 3.5 m/s^2, 15) T = 37 N, a = 2.5 m/s^2, 16) 150 N, 17) 190 N, 18) 31 N [down], 19) 3.0x10^3 N, -3.0x10^3 N, 1.5x10^6 m/s^2, -3.8x10^2 m/s^2, 20) 9.5x10^5 N [towards the Earth's center], 21) 4.9 m/s^2 [down], 22) 8.0 N.