DEPARTMENT OF PHYSICS
CLASS IX WORK SHEET: 1
GRAVITATION

Conceptual Questions

1	When a spring balance, holding mass is let to fall freely, what reading will it show?	**1**
2	The value of G on the surface of the earth is $6.67 \times 10^{-11}\ Nm^2kg^{-2}$. What will be its value on the surface of the moon?	**1 (2011)**
3	Two balls of different masses are thrown vertically upwards with same initial speed. Which one of them will rise to the greater height?	**1**
4	Suppose gravity of earth suddenly becomes zero, then in which direction will the moon begin to move, if no other celestial body affects it?	**1**
5	Differentiate between Universal gravitation constant and acceleration due to gravity.	**1**
6	Explain why a sheet of paper falls slower than one that is crumpled in to a ball?	**1**
7	Write any two applications of Archimedes' principle.	**1**
8	An egg sinks in fresh water but floats in highly salty water. Why?	**1 (2012)**
9	Define the S.I unit of pressure.	
10	Draw a diagram to show the forces acting on an object which is immersed in a liquid. Also name the forces.	**2**
11	Differentiate between upthrust and weight. When does an object float or sink when immersed in a liquid?	**2 (2012)**
12	Distinguish between the terms mass and weight.	**2 (2012)**
13	Give reason for the following (i) school bags have broad straps (ii) needles have sharp edges	**2**
14	A ship made of iron floats on water but an iron needle sinks. Explain why.	**2**
15	Write the factors on which the buoyant force on a body immersed in a liquid depends	
16	Identical packets are dropped from two airplanes, one above the equator and the other above the north pole, both at height h. Assuming all conditions are identical, will those packets take same time to reach the surface of earth. Justify your answer.	**2**
17	What is meant by freefall? Two objects of masses m_1 and m_2 are dropped in vacuum from a height above the surface of earth. Will there be any difference in the time in which these respectively reach the ground? Give reason for your	**3 (2012)**

	answer.	
18	What is the importance of Newton's law of gravitation? According to Newton's law of gravitation, the apple and the earth experience equal and opposite forces due to gravitation. But it is the apple that falls towards the earth and not vice – versa. Why?	**3**

Numericals

19	An object is thrown vertically upwards and rises to a height of 10 m. Calculate the velocity with which the object was thrown upwards? Take g=9.8 m/s^2	**2**
20	Calculate the gravitational force between a 10 kg ball and a 20 kg ball placed at a separation of 5m.	**2**
21	The gravitational force between two objects is 100 N .How should the distance between the objects be changed so that the force becomes 50 N?	**2** **2012**
22	The weight of an object on the surface of the moon is 1.67 N and its mass on its surface is 1 kg. Calculate its weight and mass on the surface of earth. (g on earth =10 m/s^2)	**(2)** **2011**
23	The volume of a 25 g of a substance is 50 cm^3. If the density of water is 1 g/cm^3, will the substance float or sink?	**2**
24	A block of wood is kept on the table top. The mass of wooden block is 5 kg and its dimension are 40 cm × 20 cm × 10 cm Find the pressure exerted by the wooden block on the table if it made it lie on the table top with its sides of dimension (i) 20 cm x 10cm.	**2**
25	Which will exert more pressure 100 kg mass on 10 m^2 or 50 kg mass on 4 m^2? Give reason.	**2**
26	A cubical block of side 2 cm is lying on a table. If the density of the material of 10,000 kg/m^3. Find the pressure exerted by the block on the table.	**2**
27	A stone is thrown vertically upwards with a velocity of 40 m/s and is caught at the point of projection. Taking g = 10 m/s^2, calculate the maximum height reached by the stone.	**(3)** **2011**
28	The mass of the sun is 2 x 10^{30} kg and that of earth is 6 x 10^{24} kg. Calculate the force exerted by the sun on the earth and also by the earth on the sun. The orbital radius of the earth = 1.5 x 10^{11} m.	**(3)** **2011**
29	A stone is released from the top of a tower of height 50 m. Calculate its final velocity just before touching the ground.	**3**
30	A solid cube of dimension 50 cm x 50 cm x 50 cm and having a weight of 25 N is placed on a table. Calculate the pressure exerted on the table.	**3**