**DELHI PUBLIC SCHOOL BANGALORE - EAST**

**PHYSICS**

**GRAVITATION**

**NAME:\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ CLASS:IX SEC:\_\_\_\_\_ DATE: \_\_\_\_\_\_\_\_\_\_\_**

**1.**  A body of mass 1kg is attracted by the earth with a force which is equal to

      a) 9.8N

      b) 6.67x 1011

      c) 1 N

      d) 9.8m/s

**2.**  What is the gravitational force between two objects?

      a) Attractive at large distances only

      b) Attractive at small distances only

      c) Attractive at all distances

      d) Attractive at large distances but repulsive at small distances

**3.**  The value of ‘g’

      a) Increases as we go above the earth’s surface

      b) Decreases as we go to the centre of the earth

      c) Remains constant

      d) Is more at equator and less at poles

**4.**  The ball is thrown up, the value of ‘g’ will be

      a) Zero

      b) Positive

      c) Negative

      d) Negligible

**5.**  The gravitational force causes

      a) Tides

      b) Motion of moon

      c) None of them

      d) Both a & b

**6.**  The mass of the body on moon is 40kg, what is the weight on the earth.

      a) 240kg

      b) 392N

      c) 240N

      d) 400kg

**7.**  Newton’s law of gravitation applies to

      a) Small bodies only

      b) Plants only

      c) All bodies irrespective of their size

      d) For solar system

8. The weight of an object at the center of the earth of radius R is

a) zero

b) infinite

c) r times the weight at the surface of the earth

d) 1/R2 times the weight at the surface of the earth.

9. **Answer the following questions that follow on the basis of your understanding of the following paragraph and the related studied concepts.**

It has been observed in our daily life that the things released from a certain height, fall down on the earth. Newton's first law of motion does not allow any change in the state of motion of a body unless there is a net external force acting on it. This means the things falling towards the earth must be due to some force. It is said that a falling apple sparked the idea in the mind of Newton that the earth attracts all objects towards its centre. Newton generalised this idea and said that every object in this universe attracts every other object with a certain force. Heavier objects exert larger force on each other. The force with which the two objects attract each other due to their masses is called the force of gravitation or gravitational force. The force of gravitation exerted by the earth on the bodies is called gravity.

i)Two objects of different masses falling freely near the surface of moon would   
a) have same velocities of any instant  
b) have different accelerations   
c) experience forces of different magnitudes  
d) undergo a change in their inertia.  
ii) The force of attraction between two unit point masses separated by a unit distance is  
a)gravitational potential  
b)acceleration due to gravity  
c)gravitational field  
d)universal gravitational constant.  
iii) The gravitational force between two objects is F. If masses of both objects are halved without changing distance between them, then the gravitational force would become

a) F/4

b) F/2

c) F

d) 2F  
iv) The value of quantity G in the law of gravitation  
a) depends on mass of earth only  
b) depends on radius of earth only  
c) depends on both mass and radius of earth  
d) is independent of mass and radius of earth

10. Name the position on the earth where the value of 'g' is (a) maximum (b) minimum.

Justify your answer.

11. Will the force of gravitation between two bodies be same or different when they are on

(a) Earth and (b) Moon

12. What happens to the force between two object if-

a) Masses of the objects are halved.

b) Distance between the two objects is halved.

13. State the factors on which the value of 'g' depends.

14. Distinguish between force of gravity and gravitational force.

15. A sheet of paper and a stone are dropped simultaneously from the top of a building.

a)What do you observe? Why?

b) Do you think both objects can ever reach the ground simultaneously? State a situation if your answer is yes.

16. The mass of you and your friend is 50 kg each. The distance between both of you is 1m. Calculate the gravitational force between-

(a) You and your friend. (b) You and the earth. ( M earth=6 x 1024 kg , R earth = 6.38x106m)

17. The force between two objects is 2N. What will be the force if the distance is doubled?

18. A stone is dropped from the edge of a roof. Find

(a) Speed of the stone after 2s

(b) Distance travelled in 2s.

19. A stone is dropped from a height of 10m. Find the speed with which the stone hits the ground.

20. The gravitational force on a mass of 15kg on the surface of the planet is 24N. Find 'g' of the planet.

21. Find the height of a point from the surface of the earth where 'g' due to earth is 1/4th its value on the surface.

22. A ball is dropped from the jumping board of the swimming pool which is at a height of 20m. Another ball is thrown from the same position after 1s with a velocity 'u'. Both the balls hit the water together. What was the initial velocity of the second ball? Do they hit the water with same velocity?

23. An object has mass 30 kg . What is its weight -

(a) On moon (b) On another planet (g planet = 3x g earth )

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