



16. On mountains our weight will be ----- as compared to weight on the surface of earth.  
 a) Equal                      b) Greater                      c) Less                      d) None of above
17. If mass of both the bodies is 1kg and distance between their centers is 1m then the gravitational force will be equal to:  
 a) G                      b) g                      c) V                      d) None of above
18. A satellite is revolving around the earth in a circular orbit. If the radius of the orbit is increased from R to 2R. What will be its velocity?  
 a)  $\sqrt{2}v$                       b)  $v^2$                       c)  $v/2$                       d)  $\frac{v}{\sqrt{2}}$
19. An artificial satellite keeps on revolving around the earth in different orbits with uniform speed due to the?  
 a) Gravitational force                      b) Frictional force  
 c) Coulmb force                      d) Electromagnetic force
20. Relative velocity of Geostationary satellite with respect to earth is:  
 a)  $7.9 \text{ kms}^{-1}$                       b)  $11.2 \text{ kms}^{-1}$                       c)  $9.8 \text{ ms}^{-1}$                       d) Zero
21. If a rocket is fired vertically with a speed of -----, it will start revolving around the earth:  
 a)  $8 \text{ ms}^{-1}$                       b)  $8 \text{ kms}^{-1}$                       c)  $9.8 \text{ ms}^{-1}$                       d)  $11.2 \text{ kms}^{-1}$
22. Height of the Geostationary satellite above the surface of earth is:  
 a) 1000 km                      b) 3600 km                      c) 36000 km                      d) 42300 km
23. Gravitational force on the surface of earth is equal to:  
 a) G                      b) g                      c) W                      d) All of above
24. Weight of the body of mass 10 kg on the surface of moon:  
 a) 160 N                      b) 16N                      c) 1.62 N                      d) None of above

### ANSWER KEY

Q.	Ans	Q.	Ans	Q.	Ans
1	b	11	a	21	b
2	b	12	c	22	d
3	b	13	d	23	c
4	b	14	c	24	b
5	b	15	b		
6	d	16	c		
7	b	17	a		
8	d	18	a		
9	a	19	a		
10	c	20	d		

## KIPS SHORT QUESTIONS

**Q.1 Define gravitation.**

**Ans:** In the universe, there exists a force between the bodies due to which everybody of the universe attracts every other body. This force is known as force of gravitation.

**Q.2 State law of gravitation**

**Ans:** Every object in the universe attracts every other object with a force which is directly proportional to the product of their masses and inversely proportional to the square of the distance between their centers.

**Q.3 What is the relation between Law of Gravitation and Newton's Third law of motion?**

**Ans:** It is to be noted that mass  $m_1$  attracts  $m_2$  towards it with a force  $F$  while mass  $m_2$  attracts  $m_1$  with a force of the same magnitude  $F$  but in opposite direction. If the force acting on  $m_1$  is considered as action then the force acting on  $m_2$  will be reaction. The action and reaction due to force of gravitation are equal in magnitude but opposite in direction. This is in consistence with Newton's third law of motion which states, to every action there is a always an equal but opposite reaction.

**Q.4 What is Gravitational Field Strength?**

In the gravitational field of the Earth, the gravitational force per unit mass is called gravitational field strength of the Earth. At any place its value is equal to the value of  $g$  at that point. Near the surface of the Earth, the gravitational field strength is  $10 \text{ Nkg}^{-1}$ .

**Q.5 Define orbital velocity**

It is the velocity of the satellite which moves around the earth at specific height.

**Q.6 What do you know about Global Positioning System (GPS)?**

**Ans:** Global Positioning System (GPS) is a satellite navigation system. It helps us to find the exact position of an object anywhere on the land, on the sea or in the air. GPS consists of 24 Earth satellites. These satellites revolve around the Earth twice a day with a speed of  $3.87 \text{ km s}^{-1}$ .

**Q.7 What will happen if Earth suddenly stops revolving around the Sun?**

**Ans:** If Earth suddenly stops revolving around the Sun then due to attraction of sun and earth, it will fall down on the sun.

**Q.8 What do you know about geostationary satellites?**

**Ans:** Geostationary satellites are the satellites whose velocity relative to earth is zero. These satellites remain stationary with respect to the earth at the height of 42,300 km from the surface of the earth. These are used for global TV transmissions and other telecommunication purposes.

**Q.9** What is effect of the followings on the gravitational acceleration?

(i) Mass of freely falling body

(ii) Distance of freely falling body from the center of earth

**Ans:** Effect of mass

There is no effect of mass of the body on gravitational acceleration because according to the relation  $g = GM/R^2$ . This relation shows that gravitational acceleration is independent of the mass of freely falling body.

**Effect of distance from the center of earth**

Gravitational acceleration is inversely proportional to the distance of freely falling body from the center of earth. If the distance of the body is more from the center of the earth gravitational acceleration will be less and vice versa.

**Q.10** Is there any difference between the value of 'g' at the equator and at the poles?

**Ans:** As the shape of the earth is not perfect sphere but elliptical. The distance at the equator to the center of earth is more, so gravitational acceleration 'g' at equator will be less. However, as the distance at the poles to the center of the earth is less, so gravitation acceleration 'g' will be more.

**Q.11** Moon revolves around the earth, from where it gets necessary centripetal force?

**Ans:** The gravitational force between the earth and the moon provides the necessary centripetal force to moon for revolving around the earth.

**Q.12** If we go on top of the mountain, will our weight increase or decrease?

**Ans:** If the distance from the centre of the Earth increases from the average radius of the Earth, the value of 'g' will decrease. This is the reason due to which the value of 'g' is less on the top of mountains. So our weight will be decreased.

**Q.13** Why do not we observe force of attraction between any two objects around us?

**Ans:** Since the gravitational force between different objects around us is very small, so we do not feel it. However, if the mass of one or both the objects is very large, then we can observe the effect of gravitational force easily.

**Q.14** What is the gravitational force acting on the body placed at the surface of Earth?

**Ans:** Since the mass of the Earth is very large, it attracts nearby objects with a significant force. The weight of an object on the Earth is a result of the gravitational attraction between the two.