

Dr. M.K.K. ARYA MODEL SCHOOL, MODEL TOWN, PANIPAT

CLASS 9 (2018-19)

ASSIGNMENT

GRAVITATION

1 MARK QUESTION

Q1. What is difference between gravitation and gravity?

Ans: Gravitational pull of earth is called gravity.

Gravitation is the attractive force between any two objects in the universe.

Q2. State Newton's Law of Gravitation?

Ans: It states that gravitational force exerted between any two objects of masses m_1 & m_2 , whose centres are 'r' distance apart is directly proportional to product of their masses and inversely proportional to square of their distance between centres, i.e $F = Gm_1m_2/r^2$.

Q3. Define universal gravitational constant ?

Ans. The gravitational force between two objects of unit mass each separated by unit distance is equal to universal gravitational constant.

Q4. State the name and type of force which is responsible for formation of tides in the sea ?

Ans: Tides in the sea are caused due to gravitational pull of moon.

Q5. Why is law of gravitation called universal law of gravitation?

Ans: It is called universal law as it is applicable to all bodies whether big or small, whether celestial or terrestrial.

Q6. Why does moon exerts lesser force of attraction on objects than earth?

Ans: Weight of an object on moon is the force with which moon attracts it. Mass of the moon is less than that of earth. Thus, it exerts lesser force of attraction on object than earth..

Q7. What do you mean by free fall?

Ans: When a body fall towards the centre of celestial body under the influence of its gravity alone, then it is said to be in free fall.

Q8. What is acceleration due to gravity ?

Ans: The acceleration produced by an object during the course of its free fall is called acceleration due to gravity.

Q9. Two objects of masses m_1 & m_2 are dropped in vacuum from height above the surface of earth. Which one will reach the ground first and why?

Ans: Both the objects will reach ground simultaneously because acceleration due to gravity is independent of mass of falling object.

Q10. How does the value of 'g' vary with mass of object ?

Ans: The value of g is independent of mass of object instead it depend on the mass of earth /celestial body.

Q11. How is newton second law of motion related to universal law of gravitation ?

Ans by newton second law of motion

$$F=mg$$

By law of gravitation, $f=GMm/r^2$

$$mg = \frac{GMm}{r^2}$$

$$g = \frac{GM}{r^2}$$

Q12. The value of g on the surface of earth is 9.8m/sec^2 . What is the value on the surface of moon?

Ans it will be $1/6^{\text{th}}$ of 9.8m/sec^2 .

Q13. Define weight. What is the weight of an object on the centre of the earth?

Ans. The force of gravitation exerted upon an object by the earth is called weight. It is zero at the centre of the earth.

Q14. Why don't we really see the moon falling towards the earth?

Ans during its motion around the earth moon changes direction at every point. This change in direction causes change in velocity and produces acceleration. The force which causes acceleration and keeps the moon moving along a circular path is called centripetal force. In the absence of which it will pursue straight line motion. Due to this linear momentum and centripetal force it does not fall towards the earth.

Q15. Name the balances used to measure mass and weight.

Ans. Mass is measured by beam balance and weight is measured by spring balance.

Q16. Give reason why body weight is more at the poles than at equators.

Ans. Value of g is greater at poles as compared to equator because distance of pole to the centre is less than distance from equator to the centre.

Q17. What is meant by the statement that acceleration due to gravity is 9.8m/sec^2 ?

Ans it means that a freely falling body accelerates at 9.8m/sec^2 towards the centre of earth during the course of its fall towards the earth.