St. Lawrence High School

A Jesuit Christian Minority Institution

Term : 1st

Work Sheet – 27

Class – XI | Subject – Physics | Date – 27.07.20

Chapter – Gravitation | Topic – Variation of g

Choose the correct option for the following questions. $1 \times 15 = 15$

1. The value of acceleration due to gravity of a planet having mass and radius twice those of earth is –
   a. 19.6 m/s^2
   b. 9.8 m/s^2
   c. 4.9 m/s^2
   d. Zero
2. At what height in km over the earth's pole the free fall acceleration decreases by one percent? (R = 6400km)
   a. 64
   b. 80
   c. 32
   d. 1.25
3. A baby of weight 72N moves from the surface of the earth at a height half of the radius of the earth. Then gravitational force exerted on it will be –
   a. 36N
   b. 32N
   c. 40.4N
   d. 50N
4. If radius of earth is 6000km and the gravitational constant is $6.67 \times 10^{-11} N - m^2/kg^2$, then its mass is –
   a. $6 \times 10^{18} kg$
   b. $6 \times 10^{24} kg$
   c. $6 \times 10^{26} kg$
   d. $6 \times 10^{31} kg$
5. Acceleration due to gravity is g on the surface of earth. The value of the acceleration due to gravity at a height of 32 km above earth's surface is –
   a. 0.9g
   b. 0.99g
   c. 0.8g
   d. 1.01g
6. Assuming the earth to be a perfect sphere of uniform density, the acceleration due to gravity at a point 100km bellow the earth's surface is –
   a. 9.66 m/s^2
   b. 7.64 m/s^2
   c. 5.06 m/s^2
   d. 3.10 m/s^2
7. The radius of the earth is about 6400km and that of the mars is 3200km. the mass of the earth is about 10 times mass of the mars. An object weighs 200N on the surface of the earth. Its weight on the surface of the mars is –
   a. 80N
   b. 40N
   c. 20N
   d. 8N

8. Where will it be profitable to purchase 1kg of sugar?
    a. At poles
    b. At equator
    c. At 45^0 latitude
    d. At 40^0 latitude
9. If the mass of the earth is 80 times that of a planet and diameter double that of the planet and g on the earth is $9.8 m/s^2$, then the value of g of the planet is –
    a. $4.9\ m/s^2$
    b. $0.98\ m/s^2$
    c. $49\ m/s^2$
    d. $0.49\ m/s^2$
10. At what height from the earth's surface, the acceleration due to gravity will be half the value at the surface?
    a. 1600km
    b. 2650km
    c. 4800km.
    d. 6400km.
11. A spring balance is graduated on sea level. If a body is weighed with this balance at consecutively increasing heights from the earth's surface, the weight indicated by the balance –
    a. Will go on decreasing
    b. Will go on increasing
    c. Will remain same
    d. Will increase first then decrease
12. Two particles of equal masses (m) go around a circle of radius r under the action of their mutual gravitational attraction. The speed v of each particle is –
    a. $\frac{1}{2r}\sqrt{\frac{1}{Gm}}$
    b. $\sqrt{\frac{Gm}{2r}}$
    c. $\frac{1}{2}\sqrt{\frac{Gm}{r}}$
    d. $\sqrt{\frac{4Gm}{r}}$
13. If radius of the earth shrinks by 1.5% (mass remaining same), then the value of acceleration due to gravity changes by –
    a. 1%
    b. 2%
    c. 3%
    d. 4%
14. If the earth losses its gravity, then for a body –
    a. Both mass and weight become zero
    b. Neither mass nor weight becomes zero
    c. Mass becomes zero but not the weight
    d. Weight becomes zero but not the mass
15. If the mass of a body on the earth's surface is m, then its mass on the moon's surface is –
    a. 6m
    b. 2m
    c. m
    d. m/6