CBSE

GRAVITATION WS 3

Class 11 - Physics

Section A

1. In Cavendish's experiment: **[1]**

   a) net torque on bar AB having two small lead spheres due to gravitational forces is positive

   b) the net force on bar AB having two small lead spheres due to gravitational forces is positive

   c) torque on bar AB having two small lead spheres due to gravitational forces is balanced by the restoring torque of the wire

   d) the net force on bar AB having two small lead spheres due to gravitational forces is negative

2. The value of the gravitational constant G is **[1]**

   a) G = 6.67×10^{-11} N m^2/kg

   b) G = 6.67×10^{-11} N m/kg^2

   c) G = 6.67×10^{-11}N m^2/kg^2

   d) G = 6.67×10^{-11} m^2/kg^2

3. If M is the mass of the earth and R its radius, the ratio of the gravitational acceleration and the gravitational constant is: **[1]**

   a) MR^2

   b) $\frac{M}{R^2}$

   c) $\frac{M}{R}$

   d) $\frac{R^2}{M}$

4. Assuming earth to be a sphere of radius R, if g_{30° is value of acceleration due to gravity at latitude of 30° and g at the equator, the value of $g - g_{30^\circ}$ is: **[1]**

   a) $\frac{3}{4}\omega^2 R$

   b) $\frac{1}{2}m\omega R$

   c) $\omega^2 R$

   d) $\frac{1}{4}\omega^2 R$

5. What will be the formula of mass of the earth in terms of g, R and G? **[1]**

   a) $G\frac{R}{g}$

   b) $G\frac{g}{R}$

   c) $g^2\frac{R}{G}$

   d) $g\frac{R^2}{G}$

6. **Assertion:** One does not experience gravitational force in daily life due to objects of same size. **[1]**
   Reason: Value of gravitational constant is very small.

   a) Assertion and reason both are correct statements and reason is correct explanation for assertion.

   b) Assertion and reason both are correct statements but reason is not correct explanation for assertion.

   c) Assertion is correct statement but reason is wrong statement.

   d) Assertion is wrong statement but reason is correct statement.

7. **State True or False:** **[1]**

   (a) Gravitational constant (G) is a universal constant and its value does not vary with change in **[1]**

intervening medium or temperature or pressure, etc.

8. Define universal gravitational constant. **[1]**

9. Give one point of difference between g and G. **[1]**

10. What is the dimensional formula of gravitational constant? **[1]**

11. Which is scalar and which is vector amongst g and G? **[1]**

12. Why is G called the universal gravitational constant? **[1]**

Section B

13. **Fill in the blanks:** **[2]**

    (a) The value of G does not depend on the nature and _____ of the masses. **[1]**

    (b) The value of G was first determined experimentally by English scientist _____. **[1]**

14. If the mass of the sun is 2×10^{30} kg, the distance of the earth from the sun is 1.5×10^{11} m and period of revolution of the earth around the sun is one year (= 365.3 days), calculate the value of gravitational constant. **[2]**

Section C

15. Three mass points each of mass m are placed at the vertices of an equilateral triangle of side l. What is the gravitational field and potential due to three masses at the centroid of the triangle? **[5]**