

XI Physics Worksheet

Time: 30 min

Chapter#8 : Gravitation-01

Full Marks: 20

Instructions:

1. All questions are compulsory.
2. Please give the explanation for the answer where applicable.

Q1 - Write an expression for the gravitational potential at the surface of the earth.

(1 Mark)

Q2 - Suppose the earth's diameter becomes twice its present diameter but mass remains same. How does the weight of a body on the earth surface change?

(1 Mark)

Q3 - Give one important application of geostationary satellites.

(1 Mark)

Q4 - Does escape velocity depend on the mass of the object?

(1 Mark)

Q5 - What is the value of the acceleration due to gravity at a depth below earth's surface?

Why the weight of all bodies is zero at the earth's centre?

(2 Marks)

Q6 - Escape velocity of a planet is v_e . If the radius of the planet remains same, and mass becomes four times, then find the new escape velocity.

(2 Marks)

Q7 - What happens to the total energy of the satellite if its speed is increased?

(1 Mark)

Q8 - A satellite is revolving around the earth at a height of $6 \times 10^5 \text{ m}$. Find

- (a) The speed of the satellite and
- (b) The time period of the satellite.

It is given radius of the earth is $6.4 \times 10^6 \text{ m}$ and mass of the earth is $6 \times 10^{24} \text{ kg}$.

(3 Marks)

Q9 - An artificial satellite is going around the earth. Find the time period of the satellite if it is close to the surface of the earth. Radius of the earth = $6.4 \times 10^6 \text{ m}$.

(3 Marks)

Q10 - An artificial satellite is moving in a circular orbit around the earth with a speed equal to half of the escape speed from the surface of the earth. Determine

- (a) The height of the satellite above the earth's surface.
- (b) If the satellite is stopped suddenly in its orbit and allowed to fall freely towards the earth, find the speed with which it hits the surface of the earth.

(5 Marks)