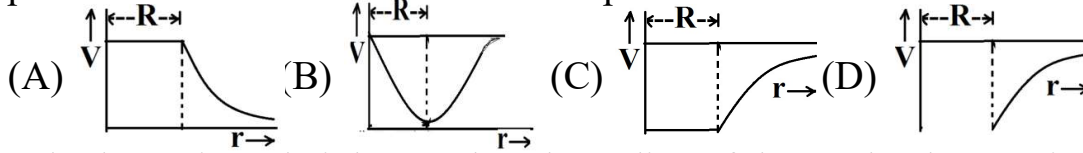


Gravitation-2

1. Which of the following curve expresses the variation of gravitational potential with distance for a hollow sphere of radius R



2. A body attains a height equal to the radius of the earth when projected from earth's surface. The velocity of the body with which it was projected is

(A) $\sqrt{\frac{GM}{R}}$ (B) $\sqrt{\frac{2GM}{R}}$ (C) $\sqrt{\frac{5GM}{4R}}$ (D) $\sqrt{\frac{3GM}{R}}$

3. Two small and heavy spheres, each of mass M, are placed a distance r apart on a horizontal surface. The gravitational potential at the mid-point on the line joining the centre of the spheres is

(A) Zero (B) $-\frac{GM}{r}$ (C) $-\frac{2GM}{r}$ (D) $-\frac{4GM}{r}$

4. The escape velocity from the earth is 11.2 km/s the mass of another planet is 100 times of mass of earth and its radius is 4 times the radius of earth. The escape velocity for the planet is

(A) 56.0 km/s (B) 280 km/s (C) 112 km/s (D) 11.2 km/s

5. Body is projected vertically upward from the surface of the earth with a velocity equal to half the escape velocity. If R is radius of the earth, the maximum height attained by the body is

(A) $\frac{R}{6}$ (B) $\frac{R}{3}$ (C) $\frac{2}{3}R$ (D) R

6. A satellite of earth of mass 'm' is taken from orbital radius 2R to 3R, then minimum work done is

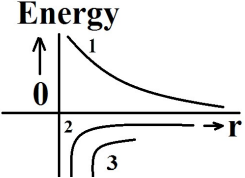
(A) $\frac{GMm}{6R}$ (B) $\frac{GMm}{12R}$ (C) $\frac{GMm}{24R}$ (D) $\frac{GMm}{3R}$

7. Two identical satellites are at the heights R and 7R from the earth's surface. Then which of the following statement is incorrect (R=Radius of the earth)

- (A) Ratio of total energy of both is 5.
 (B) Ratio of kinetic energy of both is 4.
 (C) Ratio of potential energy of both is 4.
 (D) Ratio of total energy of both is 4.

8. Escape velocity for a projectile at earth's surface is V. A body is projected from earth's surface with velocity $2V_e$. The velocity of the body when it is at infinite distance from the centre of the earth is

(A) V_e (B) $2V_e$ (C) $\sqrt{2}V_e$ (D) $\sqrt{3}V_e$

9. The orbital velocity of an artificial satellite in a circular orbit just above the earth's surface is v_0 . The orbital velocity of satellite orbiting at an altitude on half of the radius is
- (A) $\frac{3}{2} v_0$ (B) $\frac{2}{3} v_0$ (C) $\sqrt{\frac{2}{3}} v_0$ (D) $\sqrt{\frac{3}{2}} v_0$
10. A satellite is orbiting earth at a distance r . Variations of its kinetic energy, potential energy and total energy, is shown in the figure of the three curves shown in figure, identify the type of mechanical energy they represent.
- (A) 1 Potential, 2 Kinetic, 3 Total
 (B) 1 Total, 2 Kinetic, 3 Potential
 (C) 1 Kinetic, 2 Total, 3 Potential
 (D) 1 Potential, 2 Total, 3 Kinetic
- 
11. Two satellites of earth, S_1 and S_2 , are moving in the same orbit. The mass of S_1 is four times the mass of S_2 . Which one of the following statements is true?
- (A) The kinetic energies of the two satellites are equal.
 (B) The time period of S_1 is four times that of S_2 .
 (C) The potential energies of earth and satellite in the two cases are equal.
 (D) S_1 and S_2 are moving with the same speed.
12. A particle of mass M is situated at the centre of a spherical shell of same mass and radius a . The gravitational potential at a point situated at $\frac{a}{2}$ distance from the centre, will be
- (A) $-\frac{4GM}{a}$ (B) $-\frac{3GM}{a}$ (C) $-\frac{2G}{a}$ (D) $-\frac{GM}{a}$
13. A black hole is an object whose gravitational field is so strong that even light cannot escape from it. To what approximate radius would earth (mass = 5.98×10^{24} kg) have to be compressed to be a black hole?
- (A) 10^{-9} m (B) 10^{-6} m (C) 10^{-2} m (D) 100 m
14. Find the velocity of a satellite at height 80 km from earth, if the radius of earth is 6400 km
- (A) 7 km/s (B) 8 km/s (C) 7.84 km/s (D) 11.2 km/s
15. The ratio of escape velocity at earth (v_e) to the escape velocity at a planet (v_p) whose radius and mean density are twice as that of earth is
- (A) 1 : 4 (B) 1 : $\sqrt{2}$ (C) 1 : 2 (D) 1 : $2\sqrt{2}$



Physics Worksheet-43							Gravitation-2					09-03-2019		
1-C	2-A	3-D	4-A	5-B	6-B	7-A	8-D	9-C	10-C	11-D	12-B	13-C	14-C	15-D