Resonance®
Educating for better tomorrow

TARGET : NEET (UG) 2024

Course : SARANSH (Youtube Live CRASH COURSE)

PHYSICS
DPP
DAILY PRACTICE PROBLEMS
DPP NO. 1

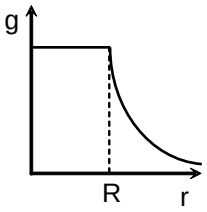
PHYSICS: GRAVITATION

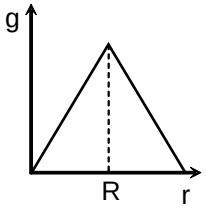
DPP No. : 1

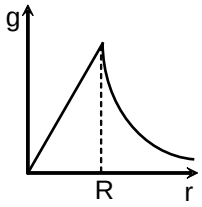
1. Imagine a light planet revolving around a very massive star in a circular orbit of radius R with a period of revolution T. If the gravitational force of attraction between planet and star is proportional to $R^{-5/2}$, then T^2 is proportional to

(1) R^3 (2) $R^{7/2}$ (3) $R^{5/2}$ (4) $R^{3/2}$

2. Assuming the earth to have a constant density, point out which of the following curves show the variation of acceleration due to gravity from the centre of earth to the points far away from the surface of earth

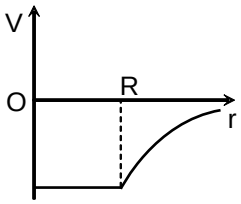
(1) 

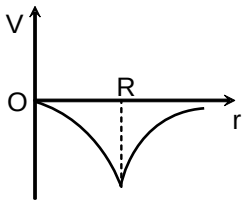
(2) 

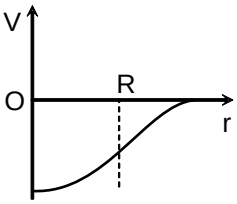
(3) 

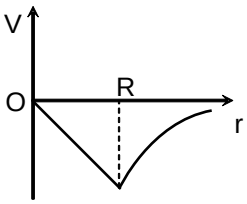
(4) None of these

3. The diagram showing the variation of gravitational potential of earth with distance from the centre of earth is

(1) 

(2) 

(3) 

(4) 

4. Assuming the earth to be a homogeneous sphere of radius R, its density in terms of G (constant of gravitation) and g (acceleration due to gravity on the surface of the earth) is

(1) $3g/(4\pi RG)$ (2) $4\pi g/(3RG)$ (3) $4\pi Rg/(3G)$ (4) $4\pi RG/(3g)$

5. A spherical shell has mass M and radius R. A point mass m/2 kept inside the shell at a distance R/2 from centre. Then force of attraction on the mass is:

(1) $\frac{2\,G\,m^2}{R^2}$ (2) $\frac{G\,m^2}{R^2}$ (3) $\frac{G\,m^2}{2\,R}$ (4) zero

6. At what height above the earth's surface does the acceleration due to gravity fall to 1% of its value at the earth's surface?

(1) 9R (2) 8R (3) 11 R (4) none of these

7. An artificial satellite moving in a circular orbit around the earth has a total (kinetic + potential) energy Eo. Its potential energy is–

(1) –Eo (2) 1.5Eo (3) 2Eo (4) Eo

8. Two particles, each of mass M, move around in a circle of radius R under the action of their mutual gravitational attraction. The speed of each particle is

(1) $\sqrt{\frac{GM}{R}}$ (2) $\sqrt{\frac{GM}{2R}}$ (3) $\sqrt{\frac{GM}{4R}}$ (4) $\sqrt{\frac{2GM}{R}}$

9. With what angular velocity the earth should spin in order that a body lying at 37º latitude may become weightless.

(1) $\frac{5}{4}\sqrt{\frac{g}{R}}$ (2) $\frac{25}{16}\sqrt{\frac{g}{R}}$ (3) $\frac{5}{3}\sqrt{\frac{g}{R}}$ (4) $\frac{25}{9}\sqrt{\frac{g}{R}}$

10. The change in the value of 'g' at a height 'h' above the surface of the earth is the same as at a depth 'd' below the surface of earth. When both 'd' and 'h' are much smaller than the radius of earth, then, which one of the following is correct ?

(1) $d = \frac{h}{2}$ (2) $d = \frac{3h}{2}$ (3) d = 2h (4) d = h