



PHYSICS

BOOKS - HC VERMA

GRAVITATION

Question Bank

1. Calculate the gravitational force between a 10 -kg ball and a 20-kg ball placed at a separation of 5 m.



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2. Three balls A, B and C are kept in a straight line. The separation between A and C is 1 m, and B is placed at the midpoint between them. The masses of A,B,C are 100 g, 200 g and 300 g respectively. Find the net gravitational force on A.



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3. Three balls A, B and C are kept in a straight line. The separation between A and C is 1 m, and B is placed at the midpoint between them. The masses of A,B,C are 100 g, 200 g and 300 g respectively. Find the net gravitational force on B.



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4. Three balls A, B and C are kept in a straight line. The separation between A and C is 1 m,

and B is placed at the midpoint between them.

The masses of A,B,C are 100 g, 200 g and 300 g respectively. Find the net gravitational force on C.



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5. The acceleration due to gravity near the earth's surface is $9.8m/s^2$, and the earth's radius is 6,400 km. From this data calculate the mass of the earth. Use any universal constant if required.



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6. Two particles of mass 200 g each are placed at a separation of 10 cm. Assume that the only forces acting on them are due to their gravitational attraction. Find the acceleration of each when they are allowed to move.



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7. A particle weighs 120 N on the surface of the earth. At what height above the earth's

surface will its weight be 30N ? Radius of the earth =6,400 km.



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8. Suppose the earth shrinks such that its radius decreases to half the present value. What will be the acceleration due to gravity on the surface of the earth?



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9. Calculate the value of the acceleration due to gravity at a place 3,200 km above the surface of the earth.



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10. The acceleration due to gravity at a place is $0.2m / s^2$. Find the height above the earth's surface .



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11. As one moves to a place 3,200 km above the earth's surface, the acceleration due to gravity reduces to $\frac{4}{9}$ of its value at the earth's surface. Calculate the radius of the earth from the data.



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12. A ball is dropped from a cliff. Find its speed 2 s after it is dropped.



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13. A ball is dropped from a cliff. Find its speed when it has fallen through 78.4 m.



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14. A ball thrown upwards takes 4 s to reach the maximum height. Find the initial speed with which it was thrown.



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15. A stone thrown upwards attains a maximum height of 19.6 m. Find the velocity with which it was thrown.



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16. A wicket keeping glove is dropped from a height of 40 m and simultaneously a ball is thrown upwards from the ground with a speed of 40 m/s. When and where do they meet ?





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17. A boy on a 78.4-m-high cliff drops a stone. One second later, he throws another stone downwards with the some speed. The two stones reach the ground simultaneously. Find the speed with which the second stone was thrown.



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