PHYSICS

NCERT - NCERT PHYSICS(GUJRATI ENGLISH)

GRAVITATION

Example

1. What is the time period of satellite near the earth's surface? (neglect height of the orbit of

satellite from the surface of the earth)?

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2. A body is projected vertically up. What is the distance covered in its last second of upward motion? $\left(g = 10m/s^2\right)$

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3. Two bodies fall freely from different heights and reach the ground simultaneously. The time of descent for the first body is $t_1 = 2s$ and for the second $t_2 = 1s$. At what height was the first body situated when the other began to fall? $\left(g = 10m/s^2\right)$

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4. A stone is thrown vertically up from the tower of height 25m with a speed of 20 m/s What time does it take to reach the ground ? $(g = 10m/s^2)$

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5. Find the time taken, by the body projected vertically up with a speed of u, to return back to the ground.

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Think And Discuss

1. Is it possible to move in a curved path in the absence of a net force?

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2. Calculate the tension in a string that whirls a 2 kg - toy in a horizontal circle of radius 2.5 m when it moves at 3m/s.

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3. According to the equation for gravitational force, what happens to the force between two bodies if the mass of one of the bodies doubled ?

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4. Is the force of gravity stronger on a piece of iron than on a piece of wood if both have the

same mass?

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5. Give an example for the motion of an object of zero speed and with non zero acceleration?

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6. Two stones are thrown into air with speeds 20 m/s, 40m/s respectively? What are accelerations possessed by the objects?

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7. When is your weight equal to mg?

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8. Give example of when your weight is zero?

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9. Where does the centre of gravity of a sphere and triangular lamina lie?

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10. Why doesn't the leaning tower of Pisa topple over?

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11. Why must you bend forward when carrying a heavy load on your back?

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Let Us Improve Our Learning Reflections On Concepts

1. How do you explain that an object is in uniform circular motion (AS_1)

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2. Caliculate the acceleration of the moon towards earth's center (AS_1)

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3. Give the law of gravitation of Newton.

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4. Explain some situations where the center of gravity of man lies outside the body. (AS_1)

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5. Where does the center of gravity of the atmosphere of the earth lie? (AS_2)

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6. Explain why a long pole is more beneficial to the tight rope walker if the pole has slight bending. (AS_7)

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Let Us Improve Our Learning Application Of Concepts

1. A car moves with constant speed of 10 m/s in a circular path of radius 10m. The mass of the car is 1000 kg. How much is the required centripetal force for the car?

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2. What is the speed of an apple dropped from a tree after 1.5 second? What distance will it cover during this time? Take $g = 10m/s^2$ (AS_1)

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3. A ball is projected vertically up with a speed of 50 m/s. Find the maximum height , the time to reach the maximum height, and the speed at the maximum height $\left(g = 10m/s^2\right)(AS_1)$

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4. Two spherical balls of mass 10 kg each are placed with their centers 10 cm apart. Find the gravitational force of attraction between them. (AS_1)

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5. Find the free-fall acceleration of an object on the surface of the moon, if the radius of the moon and its mass are 1740 km and

7.4×10^{22} kg respectively. Compare this value with free fall acceleration of a body on the surface of the earth. (AS_1)

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6. A ball is dropped from a height. If it takes 0.2s to cross the last 6m before hitting the ground, find the height from which it is dropped. Take $g = 10 \frac{m}{/} s^2 (AS_1)$

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7. The bob of a simple pendulum of length 1 m has mass 100g and a speed of 1.4 m/ s at the lowest point in its path. Find the tension in the string at this moment. Take $g = 9.8m/\sec^2(AS_1)$

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8. What path will the moon take when the gravitational interaction between the moon and earth disappears? (AS_2)

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9. Can you think of two particles which do not exert gravitational force on each other why? (AS_2)

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10. Why is it easier to carry the same amount of water in two buckets, one in each hand rather than in a single bucket? (AS_7)

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Let Us Improve Our Learning Higer Order Thinking Questions

1. A man is standing against a wall such that his right shoulder and right leg are in contact with the surface of the wall along his height. Can he raise his left leg at this position without moving his body away from the wall? Why? Explain. (AS_7)

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2. An apple falls from a tree. An insect in the apple finds that the earth is falling towards it with an acceleration 'g'. Who exerts the force needed to accelerate the earth with this acceleration? (AS_7)

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Let Us Improve Our Learning Multiple Choice Questions

1. The acceleration which can change only the direction of velocity of a body is called

A. Acceleration due to gravity

B. Uniform acceleration

C. Centripetal acceleration

D. Centrifugal acceleration

Answer:

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2. The distance between the Earth and the Moon is

A. 3,84,400 Km

B. 3,84,400 cm

C. 84,000 Km

D. 86,000 Km

Answer:

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3. The value of Universal Gravitaitonal Constant is

A. $6.67 \times 10^{-11} N.m^2 Kg^{-2}$

B. $9.8 m/\sec^2$

C. $6.67 \times 10^{-12} N.m^2 Kg^{-2}$

D. $981 m/\sec^2$

Answer:

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4. The weight of an object whose mas is 1 Kg is

A. $1Kg/m^2$

B. $9.8m/\sec^2$

C. $9.8N$

D. $9.8N/m^2$

Answer:

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5. The state of a freely falling body is

A. Heavy wiehgt

B. Less weight

C. Weight less

D. Constant weight

Answer:

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