PHYSICS

BOOKS - CAMBRIDGE PHYSICS (KANNADA ENGLISH)

GRAVITATION

Question Hour

1. State the universal law of gravitation .

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2. Write the formula to find the magnitude of the gravitational force between the earth and an object on the surface of the earth.

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3. What do you mean by free fall ?

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4. What do you mean by acceleration due to gravity ?

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5. What are the difference between the mass of an object and its weight ?

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6. Why is the weight of an object on the moon 1/6 its weight on the earth ?

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7. Why is it difficult to hold a school bag having a strap mode of a thin and strong string?

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8. What do you mean by buoyancy ?

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9. Why does an object float or sink when placed on the surface of water?

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10. You find your mass to be 42 kg on a weighing machine. Is your mass more or less than 42 kg ?

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11. You have a bag of cotton and an iron bar, each indicating a mass of 100 kg when measured on a weighing machine. In reality one is heavier than other. Can you say which one is heavier and why?

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Exercise

1. How does the force of gravitation between two objects change when the distance between them is reduced to half?

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2. Gravitational force acts on all objects in proportion to their masses. Why the, heavy object does not fall faster than a light object?

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3. What is the magnitude of the gravitational force between the earth and a 1 kg object emits surface? (Mass of the earth is $6 \times 10^{24} kg$ and radius of the earth is $6.4 \times 10^{6} m$).

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4. The earth and the moon are attracted to each other by gravitational force. Does the earth attract the moon with a force that is greater or smaller or the same as the force with which the moon attracts the earth? Why.

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5. If the moon attracts the earth why does the earth not move towards the moon?

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6. What happens to the force between two objects.

(i) The mass of one object is doubled?

The distance between the objects is doubled and tripled

The masses of both objects is doubled?

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7. What is the importance of universal law of gravitation?

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8. What is the acceleration of free fall?

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9. What do we call the gravitational force between the earth and an object?

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10. Amit buys few grams of gold at the poles as per instruction of one of his friends. He hands over the same when he meets him at the equator. Will the friend agree with the weight of gold bought? If not why [Hint : The value of g is greater at the poles than at the equator.

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11. Why will a sheet of paper fall slower than one that is crumbled into a ball?

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12. Gravitational force on the surface of the moon is only 1/6 as strong as gravitational force of the earth. What is the weight in newtons of a 10kg object on the moon and on the earth.

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13. The ball is thrown vertically upwards with a velocity of 49 m/s calculate.

(i) The maximum beight to which it rises.

(ii) The total time it takes to return to the surface of the earth.

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14. A stone is released from the from the top of a tower of height 19.6m calculate its final velocity just before touching the ground.

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15. A stone is thrown vertically upwards with an initial velocity of 40 m/s. Taking $g = 10m/s^2$ find the maximum height reached by the stone. What is the net displacement and the total distance covered by the stone.

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16. Calculate the force of gravitation between the earth and the sun, given that the mass of the earth $= 6 \times 10^{24} kg$ and the sun $= 2 \times 10^{10} kg$. The average distance between the two is $1.5 \times 10^{11} m$.

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17. A stone is allowed to fall form the top of a tower 100m high and at the same time another stone is projected vertically upwards from the ground with a velocity of 25 m/s calculate. When and where the two stones will meet.

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18. A ball thrown up vertically returns to the thrower after 6s.

(a) The velocity with which it was thrown up,

The maximum height it reaches, and

© Its position after 4s

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19. In what direction dose the huoyant force on the object immersed in a liquid act ?

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20. Why does a block of plastic released under water come up to the surface of water?

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21. The volume of 50g of a substance is $20cm^3$ s. If the density of water is $1gcm^3$, will the substance float or sink.

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22. The volume of a 500g sealed packet is $350cm^3$. Will the packet float or sink in water if the density.

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Additional Questions Answer The Following

1. Define thrust ?

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2. Why a truck or a motorbike has much wide tyres ?

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3. Why are knives sharp ?

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4. While swimming why do we fell light ?

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5. What is relative density ?

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6. The relative density of gold is 19.3. The density of water is $103kg/m^3$? What is the density of gold is S.I unit ?

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7. Two cork piece of same size and mass are dipped in two beakers containing water and oil. One cork floats on water but another sink in oil. Why ?

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8. What is lactometer and hydrometer ?

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9. Why do nails have pointed tips ?

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10. Why is the wall of dam reservoir thicker at the bottom ?

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Additional Questions Fill In The Blanks

1. The SI unit of density is _____

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2. The S.I unit of pressure is _____

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3. _____ is the value of universal gravitational constant.

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4. The radius of the earth is _____.

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5. The value of acceleration due to gravity of the earth.

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Additional Questions Match The Following

1.

(1)	Force between the sum & moon	(a)	$F = Gm_1m_2ld^2$sum and moon
(2)	Gravitational constant G	(b)	used to determine acceleration
(3)	Simple pendulum	(c)	depends on masses
(4)	Newton's law of gravitation	(d)	Action at a distance
		(e)	is universal

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