



# PHYSICS

## BOOKS - SURA PHYSICS (TAMIL ENGLISH)

### LAWS OF MOTION

**Textbook Evaluation Choose The Correct Answer**

**1. Inertia of the body depends on**

A. weight on the object

B. acceleration due to gravity of the planet

C. mass of the object

D. Both a & b

**Answer: C**



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2. Impulse is equals to \_\_\_\_\_

A. rate of change of momentum

B. rate of force and time

C. change of momentum

D. rate of change of mass

**Answer: C**



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**3. Newton's III law is applicable \_\_\_\_\_.**

A. for a body is at rest

B. for a body in motion

C. both a & b

D. only for bodies with equal masses

**Answer: C**



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4. Plotting a graph for momentum on the X-axis and time on Y-axis . Slope of momentum - time graph gives \_\_\_\_\_

A. Impulsive force

B. Acceleration

C. Force

D. Rate of force

**Answer: C**



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5. In which of the following sport the turning effect of force used ?

A. swimming

B. tennis

C. cycling

D. hockey

**Answer: C**



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6. The unit of 'g' is  $ms^{-2}$ . It can be expressed as \_\_\_\_\_.

A.  $cms^{-1}$

B.  $Nkg^{-1}$

C.  $Nm^2kg^{-1}$

D.  $cm^2s^{-2}$

**Answer: B**



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7. One kilogram force equals to \_\_\_\_\_

A. 9.8dyne

B.  $9.8 \times 10^4 N$

C.  $98 \times 10^4$  dyne

D. 980 dyne

**Answer: C**



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8. The weight of a body is measured on planet Earth as  $M$  . When it is taken to a planet of radius half that of the Earth then its value will be \_\_\_\_\_ .



A.  $4M$

B.  $2M$

C.  $M/4$

D.  $M$

**Answer: C**



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9. If the Earth shrinks to 50% of its real radius its mass remaining the same, the weight of a body on the Earth will \_\_\_\_\_

A. decrease by 50%

B. increase by 50%

C. decrease by 25%

D. increase by 300%

**Answer: C**



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**10.** To project the rockets which of the following principle(s) is /(are) required ?

A. Newton's third law of motion

B. Newton's law of gravitation

C. law of conservation of linear momentum

D. both a and c

**Answer: D**



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**Textbook Evaluation Fill In The Blanks**

1. To produce a displacement \_\_\_\_\_ is required .



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2. Passengers lean forward when sudden brake is applied in a moving vehicle. This can be explained by \_\_\_\_\_.



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3. By convention , the clockwise moments are taken as \_\_\_\_\_ and the anticlockwise moments are taken as \_\_\_\_\_.



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4. \_\_\_\_\_ is used to change the speed of car .



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5. A man of mass 100 kg has a weight of \_\_\_\_\_ at the surface of the Earth .



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**Textbook Evaluation State Whether The Following Statements Are True Or Fales Correct The Statement If It Is False**

1. The linear momentum of a system of particles is always conserved .



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2. Apparent weight of a person is always equal to his actual weight



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3. Weight of a body is greater at the equator and less at the polar region .



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4. Turning a nut with a spanner having a short handle is so easy than one with a long handle .



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5. There is no gravity in the orbiting space station around the Earth . So the astronauts feel weightlessness .



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1. Match the following :



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## Textbook Evaluation Assertion And Reason

1. Assertion : The sum of the clockwise moments is equal to the sum of the anticlockwise moments.

Reason : The principle of conservation of

momentum is valid if the external force on the system is zero .

A. If both the assertion and the reason are true and the reason is the correct explanation of assertion .

B. If both the assertion and the reason are true but and the reason is not the correct explanation of assertion .

C. Assertion is true , but the reason is false

.

D. Assertion is false , but the reason is true

.

**Answer: B**



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2. Assertion : The value of 'g' decreases as height and depth increases from the surface of the Earth .

Reason : 'g' depends on the mass of the object and the Earth .

A. If both the assertion and the reason are true and the reason is the correct explanation of assertion .

B. If both the assertion and the reason are true but and the reason is not the correct explanation of assertion .

C. Assertion is true , but the reason is false .

D. Assertion is false , but the reason is true .

**Answer: C**



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## **Textbook Evaluation Answer Briefly**

**1. Define inertia. Give its classification .**



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2. Classify the types of force based on their application .



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3. If a 5N and a 15 N forces are acting opposite to one another . Find the resultant force and the direction of action of the resultant force



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4. Differentiate mass and weight .



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5. Define moment of a couple.



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6. State the principle of moments .



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7. State Newton's second law .



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8. Why a spanner with a long handle is preferred to tighten screws in heavy vehicles ?



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9. While catching a cricket ball the fielder lowers his hands backwards. Why?





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10. How does an astronaut float in a space shuttle ?



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**Textbook Evaluation Solve This Given Problem**

1. Two bodies have a mass ratio of 3:4. The force applied on the bigger mass produces an

acceleration of  $12 \text{ m s}^{-2}$ . What could be the acceleration of the other body, if the same force acts on it.



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2. A ball of mass  $1 \text{ kg}$  moving with a speed of  $10 \text{ m s}^{-1}$  rebounds after a perfect elastic collision with the floor. Calculate the change in linear momentum of the ball.



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3. A mechanic unscrewed a nut by applying a force of 140 N with a spanner of length 40 cm . What should be the length of the spanner if a force of 40 N is applied to unscrew the same nut ?



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4. The ratio of masses of two planets is 2:3 and the ratio of their radii is 4:7 . Find the ratio of their acceleration due to gravity .



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## Textbook Evaluation Answer In Detail

1. What are the type of inertia ? Give an example for each type .



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2. State Newton's laws of motion .



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3. Deduce the equation of a force using Newton's second law of motion .



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4. State and prove the law of conservation of linear momentum .



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5. Describe Population Age Distribution.



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6. State the universal law of gravitation and derive its mathematical expression .



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7. Give the applications of universal law gravitation .



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8. A heavy truck and bike are moving with the same kinetic energy . If the mass of the truck is four times that of the bike , then calculate the ratio of their momenta . (Ratio of momenta = 1:2)



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9. "Wearing helmet and fastening the seat belt is highly recommended for safe journey". Justify your answer using Newton's laws of motion.



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## Textbook Evaluation Hot Questions

1. Two blocks of masses 8 kg and 2 kg respectively lie on a smooth horizontal surface in contact with one another . They are pushed by a horizontally applied force of 15 N . Calculate the force exerted on the 2kg mass .



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## Government Exam Questions Answers

1. Calculate the velocity of a moving body of mass 5 kg whose linear momentum is 2 kg  $ms^{-1}$ .



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**Additional Questions Answer Choose The Correct Answer**

1. Physics that deals with the effect of force on bodies is \_\_\_\_\_.

A. Kinematics

B. Dynamics

C. Statics

D. Mechanics

**Answer: D**



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2. \_\_\_\_\_ deals with the bodies which are at rest under the action of forces .

A. Statics

B. Kinematics

C. Dynamics

D. Mechanics

**Answer: A**



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3. Study of moving bodies under the action of forces \_\_\_\_\_

A. Statics

B. Kinematics

C. Dynamics

D. Mechanics

**Answer: C**



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4. The resistance of a body to change its state of rest is called \_\_\_\_\_

- A. inertia of rest
- B. inertia of motion
- C. momentum
- D. inertia of direction

**Answer: A**



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5. The resistance of a body to change its state of motion is called \_\_\_\_\_

A. force

B. momentum

C. inertia of motion

D. inertia of direction

**Answer: C**



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6. The resistance of a body to change its direction of motion is \_\_\_\_\_

A. force

B. momentum

C. inertia of motion

D. inertia of direction

**Answer: D**



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7. An athlete runs a certain distance before taking a long jump . Why ?

A. force

B. momentum

C. inertia of motion

D. inertia of direction

**Answer: C**



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8. The act of cleaning a carpet by heating it with a stick is an example for inertia of \_\_\_\_\_

A. motion

B. direction

C. rest

D. momentum

**Answer: C**



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9. A luggage is usually tied with a rope on the roof of the buses due to \_\_\_\_\_

- A. inertia of motion
- B. inertia of direction
- C. inertia of rest
- D. momentum

**Answer: A**



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10. The momentum of massive object at rest is

\_\_\_\_\_.

A. large

B. infinity

C. zero

D. small

**Answer: C**



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11. Inertia is a \_\_\_\_\_

A. property of matter

B. type of force

C. the speed of an object

D. none of the above

**Answer: A**



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12. A & B are two objects with masses 100 kg & 75 kg respectively , then \_\_\_\_\_

- A. both will have same inertia
- B. B will have more inertia
- C. A will have more inertia
- D. both will have less inertia

**Answer: C**



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13. The physical quantity which is the measure of inertia is \_\_\_\_\_.

A. density

B. weight

C. force

D. mass

**Answer: D**



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14. The sparks produced during sharpening a knife against a grinding wheel leaves the rim of the wheel tangentially. This is due to \_\_\_\_\_

- A. inertia of rest
- B. inertia of motion
- C. inertia of direction
- D. force applied

**Answer: C**



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15. The law that gives a qualitative definition of force is \_\_\_\_\_

- A. Newton's I law
- B. Newton's II law
- C. Newton's III law
- D. Law of gravitation

**Answer: A**



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16. The SI unit of force is \_\_\_\_\_

A. energy

B. joule

C. newton

D. dyne

**Answer: C**



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17. A body is said to be under balanced force when the resultant force applied on that body is \_\_\_\_\_

A. zero

B. infinite

C. one

D. none

**Answer: A**



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18. If equal or unequal forces act along opposite directions parallel to each other , then they are called \_\_\_\_\_ parallel forces .

A. resultant

B. equilibrant

C. like

D. unlike

**Answer: D**



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19. The rotating or turning effect of a force is

-----

A. momentum

B. torque

C. couple

D. none

**Answer: B**



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20. Acceleration of an object will increase as the net forces increases depending on its  
-----

A. volume

B. mass

C. shape

D. density

**Answer: B**



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21. The formula used for Newton's II law of motion is \_\_\_\_\_.

A.  $\text{Force} = \text{mass} \times \text{acceleration}$

B.  $\text{Velocity} = \text{acceleration} \times \text{time}$

C.  $\text{Momentum} = \text{mass} \times \text{velocity}$

D.  $\text{Speed} = \text{distance} \mid \text{time}$

**Answer: A**



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22. An ice skater pushes harder with his leg muscles , he begins to move faster . This is an exmample of \_\_\_\_\_

- A. Newton's I law
- B. Newton's II law
- C. Newton's III law
- D. Law of conservation

**Answer: B**



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23. You're riding a bike when suddenly you hit a larger rock . The bike stops moving but you fly over the handle-bars . This is an example of \_\_\_\_\_



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24. When you paddle a canoe , the canoe goes forward . This is an example of \_\_\_\_\_

A. Newton's I law

B. Newton's II law



C. Newton's III law

D. Law of conservation

**Answer: C**



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**25.** The acceleration is a body is due to

-----

A. balanced force

B. unbalanced force

C. quilibriant

D. couple

**Answer: B**



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**26.** When an object undergoes acceleration

-----

A. its speed always increase

B. a force always acts on it

C. its velocity always increases

D. velocity always decreases .

**Answer: B**



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**27.** A force of 20 N is acting on an object of mass 10 kg. The acceleration produced is \_\_\_\_\_

A.  $1ms^{-2}$

B.  $2ms^{-2}$

C.  $20ms^{-2}$

D.  $10ms^{-2}$

**Answer: B**



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**28.** The physical quantity which is equal to rate of change of momentum is \_\_\_\_\_

A. displacement

B. acceleration

C. force

D. impulse

**Answer: C**



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**29.** The physical quantity which is equal to change in momentum is \_\_\_\_\_

A. velocity

B. acceleration

C. force

D. impulse

**Answer: D**



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**30.** An example for a vector quantity is \_\_\_\_\_

A. speed

B. distance

C. momentum

D. length

**Answer: C**



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**31.** Impulse is equal to \_\_\_\_\_

A.  $ma$

B.  $Ft$

C.  $mv$

D.  $\frac{v - u}{t}$

**Answer: B**



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**32.** SI unit of impulse is \_\_\_\_\_

A.  $Ns$

B.  $Ns^2$

C.  $kgms^{-2}$

D.  $kgm^2s^{-2}$



**Answer: A**



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**33.** When a force of 1 N acts on a mass of 1 kg that is forced to move , the object moves with \_\_\_\_\_.

A. 8.9 N

B. 9.8 N

C. 980 N

D. 1N

**Answer: B**



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**34.** The resultant of action & reaction forces is

-----

A. greater than zero

B. less than zero

C. zero

D. one

**Answer: C**



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**35.** Rocket works on the principle of conservation of \_\_\_\_\_.

A. mass

B. energy

C. momentum

D. velocity

**Answer: C**



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**36.** Which of the following statement is not correct for an object moving along a straight path in an accelerated motion ?

- A. its speed keeps changing
- B. its velocity always changes
- C. it always goes away from the Earth
- D. A force is always acting on it .

**Answer: C**



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**37.** A body of mass 1 kg is attracted by the Earth with a force which is equal to

\_\_\_\_\_

A.  $9.8N$

B.  $6.67 \times 10^{11}$

C.  $1N$

D.  $9.8ms^{-1}$

**Answer: A**



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**38.** According to the Newton's III law of motion  
, action & reaction \_\_\_\_\_.

- A. always act on the same body
- B. have same magnitude & direction
- C. always act in opposite directions

D. act on the either body at normal to each other

**Answer: C**



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**39.** A water tanker filled up to  $\frac{2}{3}$  of its height is moving with a uniform speed , on sudden application of the brake , the water in the tank would \_\_\_\_\_.

A. move backward

B. be unaffected

C. rise upwards

D. move forward

**Answer: D**



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**40.** The value of  $g$  \_\_\_\_\_



A. increases as we go above the Earth's surface

B. decreases as we go to the centre of the Earth

C. remains constant

D. is more at equator and less at poles

**Answer: D**



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41. The ball is thrown up , the value of  $g$  will be

-----

A. zero

B.  $+ve$

C.  $-ve$

D. negligible

**Answer: C**



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42. The distance between two bodies becomes 6 times more than the usual distance , then force becomes \_\_\_\_\_

A. 36 times

B. 6 times

C. 12 times

D.  $\frac{1}{36}$  times

**Answer: D**



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**43.** Newton's law of gravitation applies to

A. small bodies only (b) plants only

B. all bodies irrespective of their size

C. for solar system

D.

**Answer: C**



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44. A thief stole a box with valuable article of weight 'w' and jumped down a wall of height 'h'. Before he reached the ground he had experienced a load of

A.  $\frac{w}{2}$

B. zero

C. 2

D. 2w

**Answer: B**



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45. Action of a lever is an example of \_\_\_\_\_ force .

- A. balanced
- B. unbalanced
- C. parallel force
- D. like parallel force

**Answer: B**



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**46.** If the radius of the Earth were to shrink by one percent its mass remaining the same, the acceleration due to gravity on the Earth's surface would \_\_\_\_\_

- A. decrease
- B. remains unchanged
- C. increase
- D. none of these

**Answer: C**



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47. The force of gravitation between two bodies in the universe does not depend on \_\_\_\_\_ .

A. the distance between them

B. the product of their masses

C. the sum of their masses

D. the gravitational constant

**Answer: C**





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**48.** The product of mass & velocity of a moving body is \_\_\_\_\_.

A. force

B. direction

C. linear momentum

D. inertia

**Answer: C**



49. \_\_\_\_\_ stated that the natural state of all Earthly bodies is at rest .

A. Aristole

B. Galileo

C. newton

D. Pluto

**Answer: A**



50. \_\_\_\_\_ deals with the bodies which are at rest under the action of forces .

A. Kinetics

B. Kinematics

C. Dynamics

D. none of the above

**Answer: D**



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51. At the surface of Earth an object falling freely experience an acceleration of \_\_\_\_\_

A.  $9.4ms^{-2}$

B.  $9.1ms^{-1}$

C.  $9.8ms^{-2}$

D.  $9.6ms^{-2}$

**Answer: C**



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52. The magnitude of the weight is expressed in the units of

- A. displacement
- B. mass (kg)
- C. force (Newton )
- D. none

**Answer: C**



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53. A lift of mass 1000 kg which is moving with an acceleration of  $1\text{ms}^{-2}$  in upward direction, then the tension developed in string which is connected to lift is \_\_\_\_\_

A. 10,000 N

B. 10,800 N

C. 9800 N

D. 11000 N

**Answer: B**



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54. The value of acceleration due to gravity on surface of the moon is \_\_\_\_\_  $ms^{-2}$ .



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55. Newton's law of \_\_\_\_\_ helps in dicovering new stars and planets.

A. inertia

B. gravitation

C. motion

D. linear momentum

**Answer: B**



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**56.** Linear momentum is  $p = \underline{\hspace{2cm}}$

A.  $m \times b$

B.  $m \times v$

C.  $m \times a$



D.  $f \times n$

**Answer: B**



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57. The weight of an object in a satellite orbiting around the Earth is \_\_\_\_\_

A. zero

B. actual weight

C. less than the actual weight

D. greater than the actual weight

**Answer: A**



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**58.** The motion of falling bodies towards Earth is due to \_\_\_\_\_

A. gravitational rotation

B. weightless mass

C. acceleration due to gravity

D. gravitational force

**Answer: D**



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**59.** Which quantity is zero at the centre of the Earth ?

A. mass

B. weight

C. both mass & weight

D. none

**Answer: B**



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**60.** What would happen , if the force of gravity disappears suddenly on Earth ?

A. All objects would move in a straight line ,  
upwards .

B. All object will float

C. not possible

D. cannot say

**Answer: A**



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**61.** The acceleration due to gravity varies on Earth with

A. distance

B. height

C. mass of an object

D. all the above

**Answer: D**



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**62.** The CGS unit of force is \_\_\_\_\_

A. Newton

B. Nm

C. dyne

D. kg f

**Answer: C**



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**63.** The apparent weight of a person moving upward in a lift is given by \_\_\_\_\_

A.  $R = W$

B.  $R = 0$

C.  $R > W$

D.  $R < W$

**Answer: C**



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**64.** If lift is accelerated in the upward direction , then the apparent weight of a body is \_\_\_\_\_.

A. more than true weight

B. equal to the true weight



C. less than true weight

D. not equal to the true weight

**Answer: A**



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**65.** A rollercoaster exhibits the phenomenon of \_\_\_\_\_

A. linear momentum

B. apparent weight

C. weightlessness

D. impulses

**Answer: C**



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**66.** The value of universal gravitational constituent is \_\_\_\_\_

A.  $6.743 \times 10^{-11} Nm^2 kg^{-1}$

B.  $6.674 \times 10^{-11} Nm^2 kg^{-2}$

$$C. 6.743 \times 10^{-11} Nm^{-2} kg$$

$$D. 6.673 \times 10^{-1} Nm^{-2} kg^{-1}$$

**Answer: B**



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**67.** The gravitational force between two objects becomes \_\_\_\_\_ when the masses of both objects are halved without altering the distance between them .

A.  $\frac{f}{4}$

B.  $\frac{f}{2}$

C.  $f$

D.  $2f$

**Answer: A**



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**Additional Questions Answer Fill In The Blanks  
Cover Whole Unit**

1. \_\_\_\_\_ deals with the motion of bodies without considering the cause of motion .



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2. Kinetics deal with the motion of bodies considering the \_\_\_\_\_.



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3. According to Aristotle , a moving body naturally comes to rest without any external force is termed as \_\_\_\_\_



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4. If the body behaves contrary to their own natural state is called \_\_\_\_\_ .



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5. The two different mass bodies dropped , the \_\_\_\_\_ falls faster .



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6. Bodies of different size , shape and mass fall from a height in \_\_\_\_\_ reach the ground at the same time .



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7. A body does not change its state during the period of time , then it is said to be at \_\_\_\_\_



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8. A body changes its state , then it is said to be in \_\_\_\_\_.



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9. The resistance of a body to change its state of rest is called \_\_\_\_\_.



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10. The product of mass & velocity of a moving body is \_\_\_\_\_.



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**11.** A sharp turn while driving a car , tend to lean sideways is due to \_\_\_\_\_.



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**12.** Momentum is a \_\_\_\_\_ quantity .



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**13.** An athlete can take a longer jump if he comes running from a distance compared to

that when he jumps suddenly. This type of inertia is \_\_\_\_\_.



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**14.** When a force of 1 N acts on a mass of 1 kg that is forced to move , the object moves with \_\_\_\_\_.



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15. The acceleration is a body is due to

-----



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16. When an object undergoes acceleration

-----



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17. Non- contact force is also known as \_\_\_\_\_ force .



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18. In balanced force , the resultant force is equal to \_\_\_\_\_



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**19.** The combined effect of multiple forces is balanced by a single force is called \_\_\_\_\_.



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**20.** The force which is equal to resultant but opposite in direction is called as \_\_\_\_\_.



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21. Like parallel forces are two forces that act along \_\_\_\_\_ direction .



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22. Torque is a \_\_\_\_\_ quantity .



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23. Unit of torque is \_\_\_\_\_.



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24. Two equal and unlike parallel force is called  
\_\_\_\_\_.



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25. If the object is rotated in clockwise direction , couple is \_\_\_\_\_.



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**26.** The moment of a couple is the product of \_\_\_\_\_ and perpendicular distance between the forces.



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**27.** Steering wheel is based on the application of \_\_\_\_\_.



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**28.** The algebraic sum of the moments in the clockwise direction is \_\_\_\_\_ to the algebraic sum moments in the anticlockwise .



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**29.** A body of mass 1 kg is attracted by the Earth with a force which is equal to \_\_\_\_\_



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30. 1 N is equal to \_\_\_\_\_.



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31. The momentum of massive object at rest is \_\_\_\_\_.



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32. The product of mass & velocity of a moving body is \_\_\_\_\_.





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**33.** The force of gravitation is inversely related to \_\_\_\_\_.



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**34.** Weight of the body acquired due to gravity is \_\_\_\_\_.



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**35.** When a person falls freely under the action of gravity has \_\_\_\_\_.



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**36.** The apparent weight of an object \_\_\_\_\_ in an elevator while accelerating upward.



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**37.** Everything in freely falling system, appears to be \_\_\_\_\_.



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38. When velocity of lift changes , apparent weight \_\_\_\_\_ from true weight.



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39. Mass is the measure of \_\_\_\_\_.



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40. Weight is the measure of force of \_\_\_\_\_  
on an object .



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41. The unit of weight is \_\_\_\_\_.



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42. The unit of mass is \_\_\_\_\_.



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**43.** Mass which is associated with force and inertia is \_\_\_\_\_.



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**44.** The weight of a 1 kg mass object on Earth is \_\_\_\_\_.



**Watch Video Solution**



**45.** Mass is associated with gravitational force is \_\_\_\_\_.



**View Text Solution**

**46.** Astronauts are not floating but falling freely due to huge \_\_\_\_\_.



**View Text Solution**

47. \_\_\_\_\_ force keeps the satellite in its orbit .



**View Text Solution**

48. To study the dimensions of heavenly bodies \_\_\_\_\_ law is used .



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49. Mechanics is divide into \_\_\_\_\_ and \_\_\_\_\_.



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50. \_\_\_\_\_ is divided into kinematics and kinetics .



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51. Kinetics deals with the motion of bodies considering the \_\_\_\_\_.



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52. \_\_\_\_\_ is also called as force independent

.



[Watch Video Solution](#)

53. \_\_\_\_\_ is also called as force dependent .



[Watch Video Solution](#)

54. \_\_\_\_\_ of a couple is measured by the product of any one of the forces and the perpendicular distance between them .



[Watch Video Solution](#)

55. \_\_\_\_\_ measures the impact of force on a body .



[Watch Video Solution](#)

**56.** Linear momentum acts in the direction of \_\_\_\_\_.



**Watch Video Solution**

**57.** Linear momentum measures the \_\_\_\_\_ on a body.



**Watch Video Solution**

58. The unit of momentum in SI system is

\_\_\_\_\_.



**Watch Video Solution**

59. The unit of momentum in C.G.S system is

\_\_\_\_\_.



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60. \_\_\_\_\_ gives the definition of force as well as inertia.



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61. Force is an external effort in the form of \_\_\_\_\_ or \_\_\_\_\_.



[View Text Solution](#)



62. \_\_\_\_\_ has both magnitude and direction .



[View Text Solution](#)

63. \_\_\_\_\_ act in opposite directions.



[View Text Solution](#)

64. \_\_\_\_\_ force is equal to the vector sum of all the forces.



[View Text Solution](#)

**65.** Forces with resultant force \_\_\_\_\_ are called balanced forces .



[Watch Video Solution](#)

**66.** Forces with resultant force \_\_\_\_\_ are called unbalanced forces .



[View Text Solution](#)

67. If the resultant force acting on a body is zero , then the body will be in \_\_\_\_\_.



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68. Unit of torque is \_\_\_\_\_.



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69. Rotating effect of a couple is known as \_\_\_\_\_.





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70. Turning a tap is an example of a \_\_\_\_\_.



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71. The C.G.S unit of couple is \_\_\_\_\_



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**72.** The direction of moment of force or couple is taken as positive if the body is rotated in the \_\_\_\_\_ direction .



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**73.** The direction of moment of force or couple is taken as \_\_\_\_\_ if the body is rotated in the clockwise direction.



**Watch Video Solution**

74. Newton's second Law helps us to measure the \_\_\_\_\_.



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75. The SI unit of force is \_\_\_\_\_



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76. A large force acting for a very short interval of time is called \_\_\_\_\_.





[View Text Solution](#)

77. Impulse is equal to magnitude of change in \_\_\_\_\_.



[View Text Solution](#)

78. A cricketer pulls his hands back while catching a ball to lower the \_\_\_\_\_ on his hands .



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79. What is Gravitational unit of force ?



[Watch Video Solution](#)

80. 1 g of f= \_\_\_\_\_ dyne .



[Watch Video Solution](#)

81. The \_\_\_\_\_ of a body does not change as long as no external force acts on it .



[View Text Solution](#)



82. \_\_\_\_\_ is based on the law of conservation of linear momentum .



[View Text Solution](#)

83. The mass of rocket decreases with \_\_\_\_\_.



[View Text Solution](#)

**84.** As the mass of a rocket decreases with altitude , it its \_\_\_\_ increases.



**View Text Solution**

**85.** The velocity at which a rocket is able to escape from the \_\_\_\_\_ of the Earth is called escape velocity.



**Watch Video Solution**

**86.** Force between the \_\_\_\_\_ is always attractive .



**Watch Video Solution**

**87.** \_\_\_\_\_ does not depend on the medium in which it is placed .



**Watch Video Solution**

**88.** The acceleration of a falling object is due to the Earth's \_\_\_\_\_ force .



**View Text Solution**

**89.** The reaction force  $R$  exerted by lift's surface is known as \_\_\_\_\_.



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90. \_\_\_\_\_ 'R' of the person that arise ,  
depending on the motion of the light .



[Watch Video Solution](#)

91. When lift is at rest , the apparent weight is  
\_\_\_\_\_ to actual weight .



[Watch Video Solution](#)

**92.** The condition for lift falling down freely is

\_\_\_\_\_.



**Watch Video Solution**

**93.** The effect take place while falling freely in

roller coaster is \_\_\_\_\_.



**View Text Solution**

**94.** There is no gravity in the orbiting space station around the Earth . So the astronauts feel weightlessness .



**Watch Video Solution**

**95.** Newton's law of \_\_\_\_\_ helps in discovering new stars and planets.



**Watch Video Solution**

96. The SI unit of gravity is \_\_\_\_\_.



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97. Mass of the Earth is \_\_\_\_\_ kg.



[View Text Solution](#)

98. The value of Universal gravitational constant is \_\_\_\_\_.



[View Text Solution](#)



**99.** Geometric radius of the Earth is \_\_\_\_\_  
in the equatorial region .



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**100.** Geometric radius of the Earth is \_\_\_\_\_  
in the polar region .



**Watch Video Solution**

**101.** The value of 'g' is maximum in the \_\_\_\_\_ region .



**Watch Video Solution**

**102.** The value of 'g' of minimum in the \_\_\_\_\_ region .



**Watch Video Solution**

**103.** The value of 'g' decreases with \_\_\_\_\_.



[View Text Solution](#)

**104.** The value of gravity is zero at the \_\_\_\_\_.



[View Text Solution](#)

**105.** The unit of mass is \_\_\_\_\_.



[Watch Video Solution](#)

**106.** The value of acceleration due to gravity on the moon is \_\_\_\_\_



**Watch Video Solution**

**107.** The motion of a body where the acceleration is equal to the acceleration due to gravity is called \_\_\_\_\_.



**Watch Video Solution**

**108.** \_\_\_\_\_ are said to be in a state of weightlessness.



**View Text Solution**

**109.** Gears in vehicles , see saw and steering wheel are the application of \_\_\_\_\_.



**Watch Video Solution**

**110.** \_\_\_\_\_ law is also called as law of force .



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**111.** In circular motion , the acceleration produced along the radius is called as \_\_\_\_\_.



[View Text Solution](#)

**112.** Impulse is also equal to the \_\_\_\_\_ of change in momentum .



[View Text Solution](#)

**113.** Dimension of \_\_\_\_\_ can be measured using gravitation law .



**View Text Solution**

**114.** One of the \_\_\_\_\_ in the motion of stars is called Wobble.



**Watch Video Solution**

**115.** The product of \_\_\_\_\_ and \_\_\_\_\_ is called impulse .



**Watch Video Solution**

**116.** \_\_\_\_\_ is the weight of the body acquired due to the action of gravity and other external forces .



**View Text Solution**



**117.** Galileo stated that , the \_\_\_\_\_ of all Earthly bodies is at rest .



**View Text Solution**

**118.** At natural state , all earthly bodies are in a state of rest or in \_\_\_\_\_.



**View Text Solution**

**119.** When dropped from a height in vacuum , bodies of different size , shape and mass reach the ground at the \_\_\_\_\_.



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**120.** When you shake the branches of a tree some fruits and leaves fall down , this is an example of \_\_\_\_\_



**Watch Video Solution**

121. A Tug of war is an example of a \_\_\_\_\_



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122. When a body is in \_\_\_\_\_, it experience balanced force .



[Watch Video Solution](#)

123. When the resultant force of a body is \_\_\_\_\_ , then the body experiences

unbalanced force .



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**124.** Drawing water from a well is an example of \_\_\_\_\_.



[Watch Video Solution](#)

**125.** The turning effect of applied force is \_\_\_\_\_ when the distance between the fixed edge and the point of application is more .



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**126.** The axis of a fixed edge about which the door is rotated is called \_\_\_\_\_.



[Watch Video Solution](#)

**127.** When the net force acting on a body is not equal to zero than its \_\_\_\_\_ changes .



[Watch Video Solution](#)

**128.** The force which produces centripetal acceleration is called \_\_\_\_\_.

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**129.** The amount of force required to produce an acceleration of  $1ms^{-2}$  in a body of mass 1 kg called \_\_\_\_\_.

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**130.** Flying motion of birds in the air is an example of Newton's \_\_\_\_\_ Law of motion.



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**131.** The apparent weight of a person moving upward in a lift will be \_\_\_\_\_.



**Watch Video Solution**

**132.** The apparent weight of a person moving in a lift will be equal to the actual weight , when the lift is at \_\_\_\_\_.



**Watch Video Solution**

**133.** A body needs a \_\_\_\_\_ to move , or bring to rest or change its velocity .



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**134.** In vacuum , two objects with a mass 1 kg and 2 kg are dropped from same height and they reach the ground at \_\_\_\_\_.



**Watch Video Solution**

**135.** Like parallel forces are two forces that act along \_\_\_\_\_ direction .



**Watch Video Solution**

**136.** \_\_\_\_\_ forces are act along opposite directions.



**Watch Video Solution**

**137.** If the resultant force is not equal to zero , then it causes the motion of the body due to \_\_\_\_\_.



**Watch Video Solution**

**138.** Force on a weight balance is an example for \_\_\_\_\_.



**Watch Video Solution**

**139.** Turning a tap , winding or unwinding a screw spinning of a top are example for \_\_\_\_\_.



**Watch Video Solution**

**140.** \_\_\_\_\_ law always act on two different bodies only .



**Watch Video Solution**

**141.** The algebraic sum of momentum after collision is numerically equal to algebraic sum of momentum before the collision in the absence of \_\_\_\_\_.



**Watch Video Solution**

**142.** Every particle of matter in this universe \_\_\_\_\_ every other particles with a force .



**View Text Solution**

**143.** The value of 'g' \_\_\_\_\_ at all points on the surface of Earth .



**View Text Solution**

**144.** The mass of Earth is \_\_\_\_\_.





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**145.** A boy of mass 50 kg runs with a force of 100N , his acceleration would be \_\_\_\_\_.



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**Additional Questions Answer Statement**  
**Whether The Following Statements Are True Or**  
**False Correct The Statement If It Is False**

1. In the recoiling of a gun on firing , both the linear momentum and kinetic energy are conserved .



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2. Change in linear momentum can be produced by applying larger force for a longer period of time.



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3. In free fall under gravity , a body appears to be weightless.



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4. The relation between absolute units of force on MKS and C.G. S system is  $1 \text{ N} = 10^5 \text{ dyne}$ .



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5. Newton's first law defines force and inertia .







[View Text Solution](#)

6. The unit of force and impulse is same .



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7. Galileo suggested, that an external force is required to keep a body in uniform motion.



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**8.** Force of action and reaction never cancel each other as they are acting at different bodies.



**View Text Solution**

**9.** Two bodies of different masses are allowed to fall freely from the same height , then both the bodies reach the Earth together .



**View Text Solution**

**10.** A person's apparent weight inside the lift increases when lift is accelerated upward .



**View Text Solution**

**11.** Newtons law of gravitation helps in discovering new stars and planets .



**View Text Solution**

12. The value of 'g' is maximum at the equatorial region and minimum in the polar region .



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13. Acceleration due to gravity can also be expressed as  $g = \frac{GM}{R^2}$  .



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**14.** Value of 'g' is zero at the centre of the Earth .



**View Text Solution**

**15.**  $1 \text{ kg } f=980 \text{ dyne}$



**View Text Solution**

**16.** The velocity which is sufficient to just escape from the gravitational pull of the Earth

is called variable velocity .



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**17.** The geometric radius of the Earth is maximum in the equatorial region and minimum in the polar region .



[View Text Solution](#)

**18.** The value of acceleration due to gravity on the surface of the moon is  $3.625ms^{-2}$  .



[View Text Solution](#)

**19.** Astronauts are not floating but falling freely around the Earth due to their huge centripetal acceleration .



[View Text Solution](#)

**Additional Questions Answer Match The Following**

1. 



[View Text Solution](#)

2. 



[View Text Solution](#)

3. 



[View Text Solution](#)



4. 



[View Text Solution](#)

5. 



[View Text Solution](#)

6. 



[View Text Solution](#)

7. 



[View Text Solution](#)

8. 



[View Text Solution](#)

9. 



[View Text Solution](#)

10. 



[View Text Solution](#)

## Additional Questions Answer Assertion And Reason

1. Assertion : A rocket moves forward by pushing the surrounding air backwards .

Reason : It derives the necessary thrust to move forward , according to Newton's second law .

A. Both assertion and reason are true and reason is correct explanation of assertion

B. Both assertion and reason are true but reason is not the correct explanation of assertion

C. Assertion is true but reason is false

D. Assertion is false , but the reason is true

.

**Answer: D**



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2. Assertion : No force is required to move a body uniformly along a straight line .

Reason : Because  $F=ma=m(0)=0$ .

A. Both assertion and reason are true and reason is correct explanation of assertion

B. Both assertion and reason are true but reason is not the correct explanation of

assertion

C. Assertion is true but reason is false

D. Assertion is false , but the reason is true

.

**Answer: A**



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**3. Assertion :** A force of 1 kg force produces an acceleration of  $1m / s^2$  in a body of mass 1 kg .

**Reason :**  $a=F/m$

A. Both assertion and reason are true and reason is correct explanation of assertion

B. Both assertion and reason are true but reason is not the correct explanation of assertion

C. Assertion is true but reason is false

D. Assertion is false , but the reason is true

.

**Answer: D**



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4. Assertion : The net force acting on a body is zero.

Reason : The body is moving uniformly along a straight line .

A. Both assertion and reason are true and reason is correct explanation of assertion



B. Both assertion and reason are true but reason is not the correct explanation of assertion

C. Assertion is true but reason is false

D. Assertion is false , but the reason is true

.

**Answer: A**



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5. Assertion : Action and reaction force balance each other .

Reason : Both forces act always on two different bodies .

A. Both assertion and reason are true and reason is correct explanation of assertion

B. Both assertion and reason are true but reason is not the correct explanation of assertion

C. Assertion is true but reason is false

D. Assertion is false , but the reason is true

.

**Answer: C**



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**6. Assertion :** If a pendulum is suspended in a lift and lift is falling freely , then its time period becomes infinite .

Reason : Free falling body has acceleration equal to acceleration due to gravity .

A. Both assertion and reason are true and reason is correct explanation of assertion

B. Both assertion and reason are true but reason is not the correct explanation of assertion

C. Assertion is true but reason is false

D. Assertion is false , but the reason is true

.

**Answer: A**



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7. Assertion : If Earth suddenly stops rotating ,  
the value 'g' becomes same at all places .

Reason : 'g' depends on the distance between  
two objects .

A. Both assertion and reason are true and reason is correct explanation of assertion

B. Both assertion and reason are true but reason is not the correct explanation of assertion

C. Assertion is true but reason is false

D. Assertion is false , but the reason is true

.

**Answer: B**



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8. Assertion : The ratio of inertial mass to gravitational mass is equal to one .

Reason : The inertial mass & gravitational mass of a body are equivalent .

A. Both assertion and reason are true and reason is correct explanation of assertion

B. Both assertion and reason are true but reason is not the correct explanation of assertion

C. Assertion is true but reason is false

D. Assertion is false , but the reason is true

.

**Answer: A**



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9. Assertion : Like forces equal in magnitude simultaneously acts on a body leads translatory or rotatory motion .

Reason : Act in the same direction of action of force leads translatory , acting tangent to the body leads rotatory .

A. Both assertion and reason are true and reason is correct explanation of assertion

B. Both assertion and reason are true but reason is not the correct explanation of assertion

C. Assertion is true but reason is false

D. Assertion is false , but the reason is true

.

**Answer: A**



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**10. Assertion :** The impact of a force is more if the velocity and mass of the body is more .

**Reason :** The linear momentum measures the impact of a force on a body.

A. Both assertion and reason are true and reason is correct explanation of assertion

B. Both assertion and reason are true but reason is not the correct explanation of assertion

C. Assertion is true but reason is false

D. Assertion is false , but the reason is true

.

**Answer: A**



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**11.** Assertion : Propulsion of rocket is based on escape velocity .

Reason : Velocity which is sufficient to escape

from Earth's gravitational pull is called escape velocity .

A. Both assertion and reason are true and reason is correct explanation of assertion

B. Both assertion and reason are true but reason is not the correct explanation of assertion

C. Assertion is true but reason is false

D. Assertion is false , but the reason is true

.

**Answer: D**



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**12. Assertion :** Gravitational force exerted on a body is weight .

**Reason :** Acceleration due to gravity for Earth is  $9.8ms^{-2}$  .

A. Both assertion and reason are true and reason is correct explanation of assertion

B. Both assertion and reason are true but reason is not the correct explanation of assertion

C. Assertion is true but reason is false

D. Assertion is false , but the reason is true

.

**Answer: B**



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**13.** Assertion : Astronauts are not floating but falling freely around the Earth due to their huge orbital velocity .

Reason : Astronauts and spacestation have equal acceleration , they are under free fall condition .

A. Both assertion and reason are true and reason is correct explanation of assertion



B. Both assertion and reason are true but reason is not the correct explanation of assertion

C. Assertion is true but reason is false

D. Assertion is false , but the reason is true

.

**Answer: A**



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## Additional Questions Answer Use The Analogy To Fill In The Blank

1. Unit of linear force : N :: Unit of torque  
: \_\_\_\_\_



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2. Unit of force of CGS is 1 dyne =  $1gcm s^{-2}$  ::

Unit of force is SI is 1N = \_\_\_\_\_



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3. Natural motion : Force independent ::

Violent motion : \_\_\_\_\_



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4. Opening a pen cap : \_\_\_\_\_ :: Opening the  
door : moment of force



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5. Clockwise moment : negative, :: Anti-clockwise moment : \_\_\_\_\_



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6. Statics : rest :: Dynamics : \_\_\_\_\_



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7. Law of inertia : Newton's 1 law :: Law of force : \_\_\_\_\_



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8. Torque ( $\tau$ ) :  $F \times d$  :: Moment of couple (M)

: \_\_\_\_\_



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9. Upward motion :  $R > W$  :: Downward

motion : \_\_\_\_\_



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## Additional Questions Answer Arrange The Following In Correct Sequence

1. Arrange the scientists according to their periods and achievements.

Galileo , Einstein , Newton , Nicolaus Copernicus



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Additional Questions Answer Very Short Answers

1. Bodies of larger mass need greater effort to put them in motion. Why ?



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2. A constant force  $F$  acts on a truck over a distance  $s$  and for a time  $t$ . What is the momentum gained by the truck ?



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3. A force of 1 N acts on a body of mass 1 g ,  
Calculate the acceleration produced in the  
body .



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4. If a force is acting on a moving body  
perpendicular to the direction of motion ,  
then what will be its effect on the speed of  
the body ?



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5. If the net force acting on a body be zero , then will the body remain necessarily in rest position ?



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6. A lift is accelerated upward . What is apparent weight of a person inside the lift ?



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7. When will be the force exerted by the floor of an elevator on the foot of a person standing there is more than the weight of the person ?



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8. When a ball of 0.5 kg mass moving with a speed of  $20 \text{ ms}^{-1}$  rebounds after striking normally a perfectly elastic wall. Find the change in momentum.



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**9.** Thief jumps from roof of a house with a box of weight  $W$  on his head . What will be the weight of the box as experienced by the thief during jump ?



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**10.** Action and reaction forces do not balance each other . Why ?



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**11.** Why does a gun recoil when a bullet is fired ?



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**12.** A brinjal vendor sells his brinjal using a beam balance in an elevator . Will he gain more if the elevator is accelerating up ?



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13. Which law is used in geotropism ?:



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14. A boy puts a heavy box of mass  $M$  on his head and jumps down from the top of a multistoried building to the ground . How much is the force exerted by the box on his head during his force fall ? Does the force of gravity increase during the fall ?



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15. What is meant by natural motion ?



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16. What is equilibrant ?



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17. What is Torque ? (or ) moment of force ?



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**18.** Write the convention rule of couple .



**View Text Solution**

**19.** What is the use of Steering Wheel ?



**View Text Solution**

**20.** Define 1N.



**View Text Solution**

21. Define 1 dyne .



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22. What is Unit force ?



[View Text Solution](#)

23. What is Impulsive force ?



[View Text Solution](#)



**24.** Define impulse .



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**25.** What is meant by Apparent weight ?



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**Additional Questions Answer Short Answers**

1. An athlete runs a certain distance before taking a long jump . Why ?



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2. What is mechanics?



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3. When is a body said to be in rest and motion ?



**Watch Video Solution**

**4. What is resultant force ?**



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**5. Distinguish between balanced and unbalanced force .**



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6. Define Linear Momentum .



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7. How can you measure torque ?



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8. Handle in a door is always placed at the edge of door . Why ?



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**9.** What is Gravitational unit of force ?



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**10.** Take two eggs and drop them from a certain height one by one . Drop one egg onto a concrete floor and another one onto a cushion pillow . What changes do you notice ?  
When the egg is dropped onto a concrete floor , it breaks. But , the egg is dropped onto

the cushion pillow . What changes do you notice ? When the egg is dropped onto a concrete floor , it breaks . But , the egg dropped onto the cushion pillow does not break . Can you explain why ?



[View Text Solution](#)

**11.** What is meant by Weightlessness ?



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**12.** Give more examples for the cases in which the time of action of force is made large to have less force ?



**View Text Solution**

**13.** Give examples for the cases in which the time of action of force is very short to have a large force ?



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**14.** If 25 N of force is used to compress a spring , then how much reactive force exerted by spring ?



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**15.** Is it possible to open a cap of pen with one hand ? If not give reason .



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**16.** What happen to the weight of a person while he goes from polar region to equator ?



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**17.** Classify the following things into like parallel and unlike parallel forces ( Dragging water from well , force applied to crow bar , weight balance , turning pen cap )



**View Text Solution**

1. Weight of a person inside the lift while at rest is 50 N. What is the weight he feels when lift moves up with an acceleration of  $9.8\text{ms}^{-2}$ .



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2. A 20 g bullet moving at 300 m/s stops after penetrating 2 cm of bone. Calculate the

average force exerted by the bullet .



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3. A bullet of mass 50 g moving with a speed of  $300 \text{ m s}^{-1}$  is brought to rest in 1 s . Find the impulse and the force .



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4. A cricket ball of mass 150 g moving with a speed of  $12 \text{ m s}^{-1}$  is hit by a bat so that the

ball is turned back with a velocity of  $20\text{m.s}^{-1}$  .

Calculate the impulse received by the ball ?



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5. Calculate the mass of a body weighing 100

dyne .  $g = 10\text{m} / \text{s}^2$



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6. A cricket ball of mass 100 g moving with a

speed of  $20\text{ms}^{-1}$  is brought to rest by a

player . Find the change in momentum of ball.



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7. A sphere of mass 20 kg moving with a velocity  $40\text{m s}^{-1}$  collides with another sphere of mass 15 kg which is at rest . After collision they move with the same velocity . Find the velocity .



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**8.** A force of 200 dyne acts on a body of mass 10 g for 5 s. What will be the velocity of the body if it starts from rest ? Express in SI unit .



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**9.** A force of 60 N acts on a body for 10 s. What is the change in momentum ?



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**10.** A body of mass 2 kg moving with uniform velocity of  $40\text{ms}^{-1}$  collides with another body at rest . If two bodies move together with a velocity of  $20\text{ms}^{-1}$  . Find the mass of the other body .



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**11.** A force of 10 kg weight acting on an object of mass for 2 s gives to it a velocity of  $10\text{ms}^{-1}$

. What is the mass of an object in kg ? [

$$g = 9.8ms^{-1}]$$



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**12.** A 2000 kg car travelling at  $20ms^{-1}$  hits concret wall and stops in 0.05s. What magnitude of impulse did the wall exert on the car ?



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**13.** The masses of two planets are in the ratio 1:2 their radii are in the ratio 1:2. Find the ratio of the acceleration due to gravity on the planets .



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**14.** A pistol fired a bullet of mass 50 g triggered with a speed  $250\text{ms}^{-1}$  penetrated into a wooden plank comes to rest at 1 ms.

Find the impulse and average force offered by the planks .



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**15.** Force of 50 N acts perpendicular on a body , which is fixed at a point O . The distance of point of action of force from O is 5 cm. Find the momentum of force .



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**16.** A person of weight 50 kg is moving down in an elevator. Calculate downward acceleration offered by the elevator whose reaction force is 400 N on the surface .



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**17.** Calculate the force of gravitation between two bodies of weight 50 kg and 10 kg respectively placed at 10 m apart . If their distance increased to 100 % then find the

change in percentage of force . ( New force is 75% less than the original force ) .



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## Additional Questions Answer Long Answers

1. What are the concept prepared by the Galileo ?



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2. Give the application of torque .



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3. Give examples for Newton's third law .



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4. Derive the Relation between  $g$  and  $G$  .



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1. Why does a recoil of a heavy gun on firing not so strong as of a light gun using the same cartridges ?



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2. If a body move with uniform velocity , what is the net force acting on a body ?



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3. Meteorites are shooting stars . They completely burn out while they hit Earth's atmosphere. Apply impulse concept to explain their burning action .



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4. A rocket with a lift - off mass 20,000 kg is blasted upwards with an initial acceleration of

$50\text{ms}^{-2}$ . Calculate the initial thrust (Force ) of the blast .



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