

12. A stone weighs 100 N on the surface of the earth. The ratio of its weight at a height of half the radius of the earth to its weight at a depth of half the radius of the earth will be approximately

- A. 3.6 B. 2.2 C. 1.8 D. 0.9

13. Two bodies P and Q , having masses M_P and M_Q respectively, exert forces on each other and have no other forces acting on them. The force acting on P is F , which gives P an acceleration a . Which of the following options is correct?

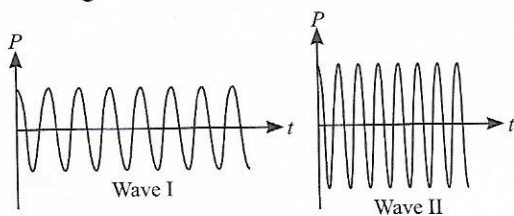
	Magnitude of force on Q	Magnitude of acceleration on Q
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- | | | |
|----|---------------------|---------------------|
| A. | $\frac{M_Q}{M_P} F$ | a |
| B. | $\frac{M_P}{M_Q} F$ | a |
| C. | F | a |
| D. | F | $\frac{M_P}{M_Q} a$ |

14. A particle is moving in a straight line with initial velocity u and uniform acceleration a . If the sum of the distances travelled in t^{th} and $(t + 1)^{\text{th}}$ seconds is 100 cm, then its velocity after t seconds in cm s^{-1} is

- A. 20 B. 30 C. 50 D. 80

15. The figure shows pressure (P) variation in two different sound waves in air with time (t) at a given position. Both the figures are drawn to the same scale.



Which of the following statements is true?

- A. Wave I has lower frequency and smaller amplitude compared to wave II.
 B. Wave I has higher frequency and greater amplitude compared to wave II.
 C. Wave I has shorter wavelength and greater amplitude compared to wave II.
 D. Wave I has shorter wavelength and smaller amplitude compared to wave II.

16. Read the given statements and select the correct option.
 Statement 1 : Waves produced by a motor boat sailing in water are both longitudinal and transverse waves.
 Statement 2 : The longitudinal and transverse waves cannot be produced simultaneously.

- A. Both statements 1 and 2 are true and statement 2 is the correct explanation of statement 1.

- B. Both statements 1 and 2 are true but statement 2 is not the correct explanation of statement 1.
 C. Statement 1 is true and statement 2 is false.
 D. Both statements 1 and 2 are false.

17. Suppose a new planet is discovered, which revolves around the Sun (*i.e.*, it is a part of our solar system). If its orbit lies between Saturn and Jupiter, its time period of revolution would be

- A. Less than that of Jupiter
 B. More than that of Jupiter
 C. Equal to that of Jupiter or Saturn
 D. More than that of Saturn.

18. Which of the following statements are correct?

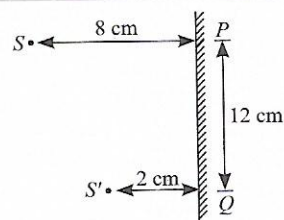
- I. It is easier to roll than to slide some heavy objects over another fixed object.
 II. If there is less friction between the car tyres and road, then the car can move forward very smoothly without skidding.
 III. Friction helps a person to climb a tree or a pole.
 IV. Friction helps us to light a matchstick.
 V. Ball bearings are designed to increase friction between moving parts of machines.

- A. I and II only B. II and III only
 C. III, IV and V only D. I, III and IV only

19. Shweta observes lightning in her area. She hears the sound 4 s after she observed lightning. How far is she from the place where lightning occurs if speed of sound in air is 330 m s^{-1} ?

- A. 1.32 km B. 2.55 km C. 1.92 km D. 0.66 km

20. A source of light S is located at a distance of 8 cm from a plane mirror. The reflected ray S' is detected 2 cm from the mirror at a vertical displacement of 12 cm. The point of reflection is at a distance of (Figure is not drawn to scale)



- A. 6.0 cm from P B. 9.6 cm from P
 C. 3.4 cm from Q D. 3.6 cm from Q

21. Consider the given cases.

- I. A ball moves vertically upwards after being thrown by Rahul.
 II. The ball falls vertically downwards after reaching the maximum height.

Name the forces responsible for the motion of ball in the two cases.

- | I | II |
|---------------------|---------------------|
| A. Muscular force | No force |
| B. Muscular force | Gravitational force |
| C. Frictional force | No force |
| D. Frictional force | Gravitational force |