



## PHYSICS

### BOOKS - MTG IIT JEE FOUNDATION

### FOOTSTEPS TOWARDS NEET

#### Multiple Choice Question

1. An object travels 16m in 4s and then another 16m in 3 s. what is the average speed of the object?

A. 4.57 m/s

B. 7.54 m/s

C. 5.74 m/s

D. 4.75 m/s

**Answer: A**



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**2. A force of 50 N moves a body. Then,**

- A. frictional force exerted on the body is less than 50 N.
- B. Frictional force exerted on the body is more than 50 N.
- C. both (a) and (b).
- D. none of these.

**Answer: A**



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

A. 29.6 m/s

B. 26.6 m/s

C. 15.6 m/s

D. 19.6 m/s

**Answer: D**



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4. A mountaineer of weight 300 N climbs up a rock face of vertical height 600 m in 5400 s. What is the average power she generates against gravity during this time?

A. 20 W

B. 33 W

C. 18 W

D. 72 W

**Answer: B**



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5. A sonar signal from a ship is emitted underwater towards the sea bed. It takes 0.7 s for the signal to bounce back from the sea bed. If sound travels at  $1500 \text{ ms}^{-1}$  in water, how deep is the sea?

A. 525 m

B. 1050 m

C. 1071m

D. 2143 m

**Answer: A**



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**6.** An object moving with uniform circular motion shows

- A. constant acceleration
- B. constant velocity
- C. constant change in direction
- D. constant change in motion

**Answer: C**



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7. When a bicycle is motion the force of friction exerted by the ground on the two wheels is such that is acts .

A. in the backward direction on the front wheel and in the forward direction on the rear wheel.



B. in the forward direction on the front wheel and in the backward direction on the rear wheel.

C. in the backward direction on both the front and the rear wheels.

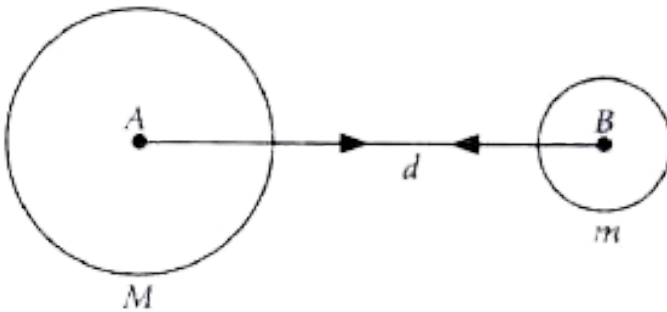
D. in the forward direction on both the front and the rear wheels.

**Answer: A**



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8. The distance between two bodies becomes 6 times more than the usual distance. Then the  $F$  becomes



A. 36 times

B. 6 times

C. 12 times

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

**Answer: D**



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9. A body possess potential energy of 460 J whose mass is 20 kg and is raised to a certain height. What is the height when  $g = 10m / s^2$  ?

A. 1.7 m

B. 2.3 m

C. 3.9 m

D. 4.1 m

**Answer: B**



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**10.** A key of a mechanical piano is struck gently and then struck again but much harder this time. In the second case :

A. sound will be louder but pitch will not be different

B. sound will be louder and pitch will also be higher

C. sound will be louder but pitch will be lower

D. both loudness and pitch will remain unaffected

**Answer: A**



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11. A particle moves  $3m$  north , then  $4m$  east and finally  $6m$  south . Calculate the distance travelled and the displacement.

A. 13 m

B. 15 m

C. 17 m

D. 20 m

**Answer: A**



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12. When we stop pedalling a bicycle we are riding, the bicycle begins to slow. This is because

- A. the earth's gravitational force acts on it
- B. it is not accelerated
- C. no unbalanced force acts on it
- D. frictional force acts on it

**Answer: D**



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13. A planet has density  $\rho$ , radius  $R$  and acceleration due to gravity as  $g$ . If the radius of the planet were doubled keeping the density same, the acceleration due to gravity at the surface will be

A.  $4g$

B.  $2g$

C.  $g$

D.  $g/2$

**Answer: B**





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**14.** A car completes its journey in a straight line in three equal parts with speeds  $v_1$ ,  $v_2$  and  $v_3$  respectively. The average speed  $v$  is given by :

A.  $\frac{v_1 + v_2 + v_3}{3}$

B.  $\sqrt{v_1 v_2 v_3}$

C.  $\frac{1}{v} = \frac{1}{v_1} + \frac{1}{v_2} + \frac{1}{v_3}$

D.  $\frac{3}{v} = \frac{1}{v_1} + \frac{1}{v_2} + \frac{1}{v_3}$

**Answer: D**



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**15.** A particle starts its motion from rest under the action of a constant force. If the distance covered in first  $10s$  is  $s_1$  and the covered in the first  $20s$  is  $s_2$ , then.

A.  $S_2 = S_1$

B.  $S_2 = 2S_1$

C.  $S_2 = 3S_1$

$$D. S_2 = 4S_1$$

**Answer: D**



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**16.** If a planet existed whose mass was twice that of Earth and whose radius 3 times greater, how much will a 1kg mass weigh on the planet?

A. 25 N

B. 2.17 N

C. 1.1 N

D. 5 N

**Answer: B**



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**17.** Best relationship between momentum and kinetic energy possesses by an object in terms of mass

A. momentum

=

$$(2m \times \text{kinetic energy})^{1/2}$$

B.  $(\text{momentum})^{1/2} = 2 \times \text{kinetic energy}$

C.  $(\text{kinetic energy})^{1/2} = 2 \times$

momentum

D. kinetic

energy

$$= (2 \times \text{momentum})^{1/2}$$

**Answer: A**

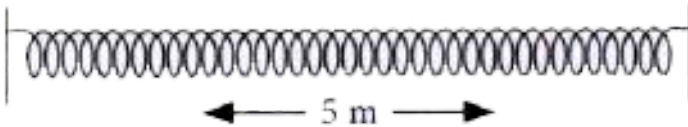


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18. A wave in slinky travelled to and fro in 5 s.

The length of the slinky is 5 m, then velocity of

wave is



A. 10 m/s

B. 5 m/s

C. 2 m/s

D. 25 m/s

**Answer: C**

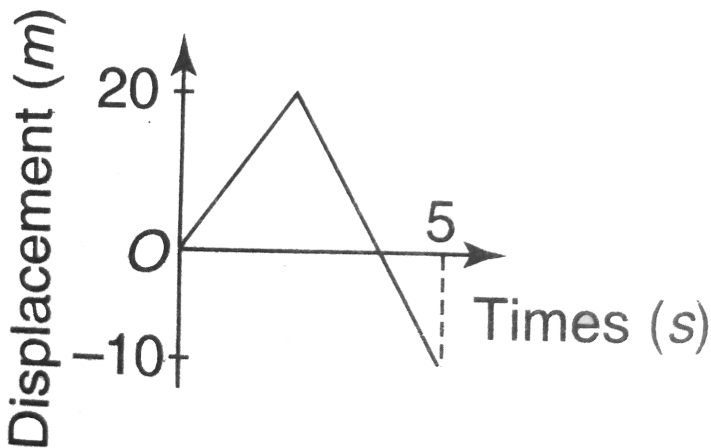


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19. The diagram shows the displacement-time graph for a particle moving in a straight line.

Find the average velocity for the interval from

$t = 0$  to  $t = 5s$ .



A.  $-2ms^{-1}$

B.  $2ms^{-1}$

C.  $-4ms^{-1}$

D.  $4ms^{-1}$

**Answer: A**



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**20. Pick the fundamental law of motion**

A. Newton's first law of motion

B. Newton's second law of motion



C. Newton's third law of motion

D. All of these

**Answer: B**



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21. A solid of density  $D$  is floating in a liquid of density  $d$ . If  $V$  is the volume of solid submerged in the liquid and  $V$  is the total volume of the solid, then  $V/V$  is equal to

A.  $\frac{d}{D}$

B.  $\frac{D}{d}$

C.  $\frac{D}{d + D}$

D.  $\frac{D + d}{D}$

**Answer: B**



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**22.** A body of mass 20 kg falls through a distance of 50 cm. Then the loss in potential energy is

A. 98 J

B. 392 J

C. 980 J

D. 5000 J

**Answer: A**



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**23.** A child watching Dussehra celebration from a distance sees the effigy of Ravana burst into flames and hears the explosion associated

with it 2 s after that. How far was he from the effigy if the speed of sound in air that night was 335 m/s?

A. 535 m

B. 670 m

C. 720 m

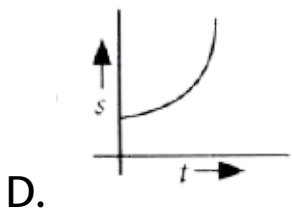
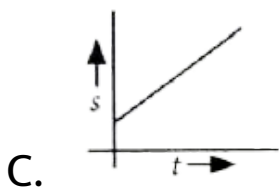
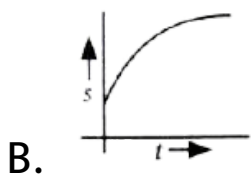
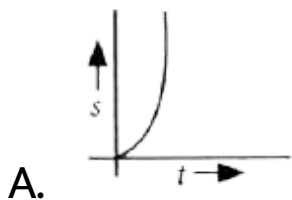
D. 420 m

**Answer: B**



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24. Using velocity time graph, establish the relation  $s = ut + \frac{1}{2}at^2$ , where the symbols have their usual meanings.



**Answer: A**



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**25.** A force acting on an object of mass 500 g changes its speed from 200 cm/s to 0.2 m/s.

The change in momentum is

- A. increase by 0.90 N s
- B. decrease by 0.90 N s
- C. increase by 90 g cm/s
- D. decrease by 90 g cm/s

**Answer: B**



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**26.** Calculate the mass of a body whose volume is  $2m^3$  and relative density is 0.52.

A. 104 kg

B. 1040 kg

C. 0.5 kg

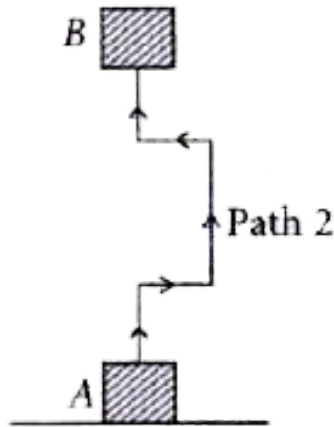
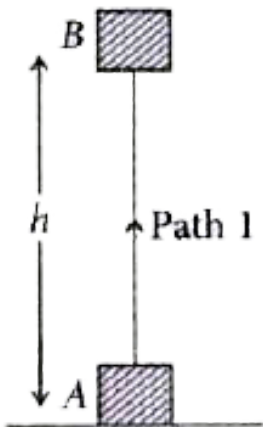
D. 20 kg

**Answer: B**



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27. A block is raised from position A to B by taking two different paths as shown in the figure. If  $AB = h$ , then





A. the work done on the block is greater in case of path 1 than in case of path 2

B. the work done on the block is greater in case of path 2 than in case of path 1

C. the work done on the block is same for both paths

D. the work done cannot be determined.

**Answer: C**



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28. If wavelength of a wave is 100 m, then 100 waves will cover \_\_\_\_\_ distanc

A. 10 km

B. 1 km

C. 100 km

D. 100 m

**Answer: A**



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29. A person is running along a circular track of area  $625\pi m^2$  ( $\pi = 22/7$ ) with a constant speed. Find the displacement in 15 seconds if he has to complete the race in 30 seconds.

A. 200 m

B. 100 m

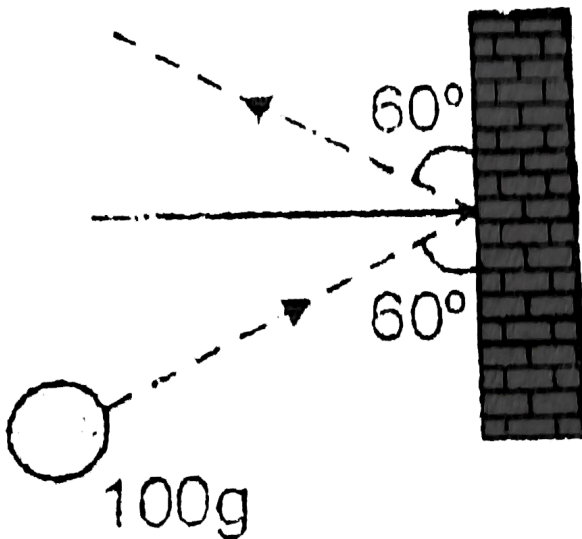
C. 25 m

D. 50 m

**Answer: D**



30. A mass of 100 g strikes the wall with speed  $5\text{ m/s}$  at an angle as shown in figure and it rebounds with the same speed at the contact time is  $2 \times 10^{-3}\text{ sec}$ . What is the force applied on the mass by the wall :



A.  $250\sqrt{3}$  to right

B. 250 N to right

C.  $250\sqrt{3}$  N to left

D. 250 N to left

**Answer: C**



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**31.** According to Newton's law of gravitation, every object attracts every other object.

Thus, if the earth attract an apple towards

itself, the apple also attracts the earth towards itself with the same force. Why then does the apple fall toward the earth, but the earth does not move towards the apple ?

A. Acceleration of the earth is very large when compared to that of apple.

B. Acceleration of the earth is equal to that of apple.

C. Acceleration of the earth is neither high nor too low.

D. Acceleration of the earth is very small when compared to that of apple.

**Answer: D**



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**32.** A boy is rotating in a circular motion, a stone of mass 500 g by using a string of length 50 cm with a speed 10 cm/s. What will be the work done by the force applied by the boy?

A.  $0.01\pi J$

B.  $\pi J$

C.  $10\pi J$

D. Zero

**Answer: D**



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**33.** A simple pendulum performs 18 oscillations per second. The mechanical wave produced by it will be



A. infrasonic wave

B. ultrasonic wave

C. subsonic wave

D. electromagnetic wave

**Answer: A**



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**34. v20**

A. 4:1

B. 3: 1

C. 1: 4

D. 1: 3

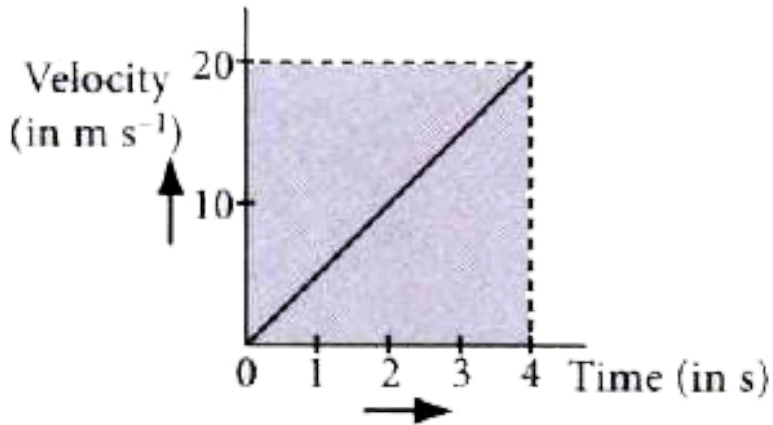
**Answer: C**



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**35.** The velocity-time graph of a ball moving on the surface of a floor as shown in figure. Calculate the force acting on the force acting

on the ball, if mass of the ball is 200g.



A. 2 N

B. 5 N

C. 1 N

D. 3 N

**Answer: C**



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**36.** A force of 100 N displacement an object through 0.2 m and does work of 10 joules. What is the angle between the force and displacement?

A.  $30^\circ$

B.  $60^\circ$

C.  $45^\circ$

D.  $90^\circ$

**Answer: B**



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**37.** Which of the following is not matched correctly

A. Force  $\text{kg m s}^{-1}$

B. Pressure -  $\text{N m}^{-2}$

C. Buoyancy - N

D. Density -  $\text{kg m}^{-3}$

**Answer: A**



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**38.** Which of the following statement(s) is/are true about sound waves?

(I) They are produced by vibrating objects.

(II) They can travel through a vacuum.

(III) They are longitudinal waves.

(IV) The speed of sound is highest in gas and lowest in a solid.

A. I and II

B. I and III

C. I and IV

D. III and IV

**Answer: B**



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**39.** The mass of a body of a body is increased 4 fold and mass of other body is increased 16 fold and mass of other body is increase 16 fold.

How should the distance between them be change to keep the same gravitational force between them ?

A. 4 times

B.  $\frac{1}{4}$  times

C. 8 times

D.  $\frac{1}{8}$  times

**Answer: C**



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**40.** Two boys A and B lift 100 bricks through the same height in 5 minutes and 6 minutes respectively. Then

- A. A has more power than B
- B. B has more power than A
- C. both have same power
- D. data insufficient.

**Answer: A**



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41. A car and a lorry are moving with same momentum, if same braking force is applied, then

A. Car comes to rest in shorter distance.

B. lorry comes to rest in shorter distance.

C. both travels same distance before coming to rest.

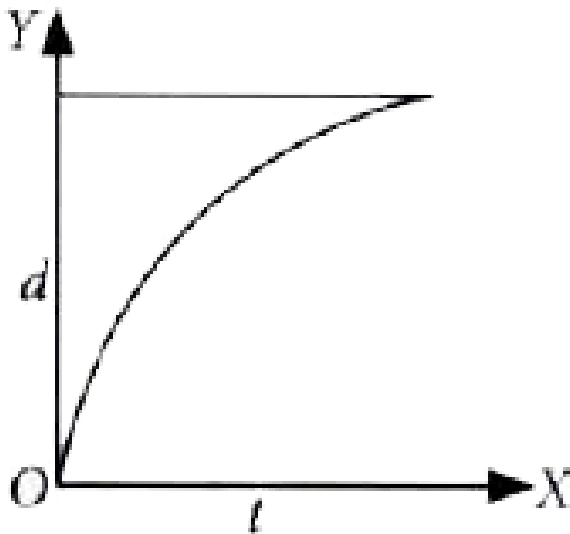
D. none of these.

**Answer: B**



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42. The distance of a particle as a function of time is shown here. The graph indicates that



A. the particle starts with certain velocity  
but the motion is retarded and finally

the particle stops.

B. the velocity of the particle is constant throughout.

C. the acceleration of the particle is constant throughout.

D. the particle starts with another constant velocity, the motion is in acceleration and finally the particle moves with another constant velocity.

**Answer: B**



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**43.** A sound wave has a frequency  $1000\text{Hz}$  and wavelength  $34\text{cm}$ . How long will it take to move through  $1\text{km}$  ?

A. 3.20 s

B. 2.94 s

C. 5.94 s

D. 3.10 s

**Answer: B**



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**44.** Moon is the natural satellite of the earth and weight of an object on the moon is one sixth times the weight of same body on the earth. If a body is raised through height  $h$  on the surface of earth and the energy spent is  $E$  then for the some amount of energy  $E$  the body on the surface of moon will rise through the height of

A.  $2h$

B. 6h

C. 4h

D. 12h

**Answer: B**



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**45.** A man has mass 70 kg and the mass of his wife is 50 kg. The ratio of the inertia of the man to the inertia of his wife is

A. 5:7

B. 1:2

C. 7:5

D. 1:3

**Answer: C**



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