

PHYSICS (2014)

51. Select the true statement:

- (1) Velocity of any object is zero then acceleration is not necessarily zero.
- (2) Velocity of any object is zero then acceleration must be zero.
- (3) An object moves with uniform speed then its acceleration is also uniform.
- (4) An object moves with non-uniform speed then its acceleration is zero.

Ans. 1

When body is at highest point in vertical motion.

52. A passenger in a moving train tosses a coin which falls behind him, this shows that the motion of train is:

- (1) Accelerated
- (2) Uniform
- (3) Retarded
- (4) Along circular track

Ans. 1

Coin has constant velocity in horizontal direction while train is accelerated.

53. The numerical ratio of displacement to distance for a moving object is:

- (1) always less than 1
- (2) equal to or more than 1
- (3) always more than 1
- (4) equal to or less than 1

Ans. 4

Magnitude of displacement is always less than or equal to distance.

54. The correct expression for the force acting on an object moving in a circular path is given by:

- (1) $F = mvr$
- (2) $F = \frac{mv}{r}$
- (3) $F = \frac{mv^2}{r}$
- (4) $F = mv^2r$

Ans. 3

$$F = \frac{mv^2}{r}$$

55. A person pushes a box with force 100 N. In this statement we talk of a force acting on box which usually means force is:

- (1) electrostatic force
- (2) balanced force
- (3) unbalanced force
- (4) nuclear force

56. A fielder pulls his hands in backward direction after catching the cricket ball. This is due to:

- (1) Apply large force on ball
- (2) Reduce the rate of change of Momentum
- (3) Increase the rate of change of Momentum
- (4) Keep the ball in hand firmly

Ans. 2

$$F = \frac{\Delta P}{\Delta t}$$

If Δt increase then force will decrease.

57. In case of negative work the angle between the force and displacement is:

- (1) 0°
- (2) 45°
- (3) 90°
- (4) 180°

Ans. 4

$$\Delta W = FS \cos 180^\circ = -FS = -ve$$

58. Two bodies of equal masses move with a uniform velocities V and $3V$ respectively. The ratio of their kinetic energy is:

- (1) 1 : 9
- (2) 1 : 3
- (3) 2 : 9
- (4) 4 : 9

Ans. 1

$$\frac{k_1}{k_2} = \frac{\frac{1}{2}mV^2}{\frac{1}{2}m(3V)^2} = 1:9$$

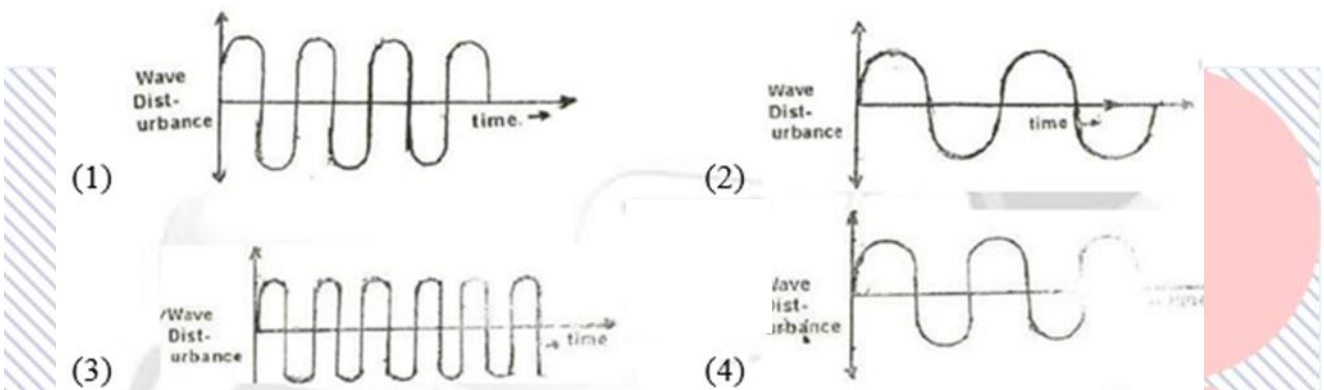
59. Four appliances each of 500 watt run for 10 hours a day. The energy spent in kwh will be:

- (1) 10 kwh
- (2) 20 kwh
- (3) 30 kwh
- (4) 5 kwh

Ans. 2

$$E = P \times t = \frac{4 \times 500 \times 10}{1000} = 20 \text{ kwh}$$

60. In which of the following the final image is erect:
- (1) Simple Microscope (2) Compound Microscope
(3) Astronomical telescope (4) Retina of the eye
61. Which of the following does a Dentist use to view the teeth for treatment:
- (1) Concave Mirror (2) Convex lens
(3) Concave lens (4) Convex Mirror
62. Which of the following graph represents sound of Maximum Pitch:



Ans. 3

Pitch depends on frequency and frequency is number of oscillation per second.

63. Which sound waves are emitted by a bat to catch its prey:
- (1) Infrasonics (2) Ultrasonics
(3) Sound of frequency 15 kHz (4) Sound of frequency 19 kHz

Ans. 2

Sound wave emitted by a bat to catch its prey is ultrasonics

64. When we change a feeble sound to a loud sound, we increases its:

- (1) frequency (2) amplitude
(3) velocity (4) wavelength

Ans. 2

Loudness depends upon intensity (and intensity depends on square of amplitude)

$$I \propto A^2$$

65. We can distinguish between the sounds produced by different singers on the basis of the characteristics of sound called:

- (1) Frequency (2) Timbre
(3) Pitch (4) Loudness

Ans. 2

Sound is distinguished by quality or timbre.

66. According to one of the Kepler's Laws of Planetary Motion:

(1) $r^2 \propto T^3$

(2) $r \propto T^2$

(3) $r^3 \propto T^2$

(4) $r^2 \propto \frac{1}{T^2}$

Ans. 3

According to Kepler's 3rd law

$$T^2 \propto r^3$$

67. If the distance between two objects is halved and their masses are doubled, then the gravitational force between them will become:

(1) 16 times

(2) 4 times

(3) 2 times

(4) No change

Ans. 1

$$\frac{F_1}{F_2} = \frac{G(2M)(2m)}{(r/2)^2} = 16 : 1$$

$$F_2 = \frac{GMm}{r^2}$$

68. In which direction do the stars appear to move:

(1) East to West direction

(2) West to East direction

(3) North to South direction

(4) South to North direction

Star appear to move from east to west because earth rotates about its axis from west to east.

69. A car moves from A to B with speed 20 km/hr and back to A with speed 30 km/hr. The average speed during the whole journey is:

(1) 25 km/hr

(2) 24 km/hr

(3) 50 km/hr

(4) 5 km/hr

Ans. 2

$$V_{\text{average}} = \frac{2s}{\frac{s}{20} + \frac{s}{30}} = 24 \text{ km / hr}$$

70. Acceleration of any particle changes, if:

(1) Direction of velocity changes

(2) Magnitude of velocity changes

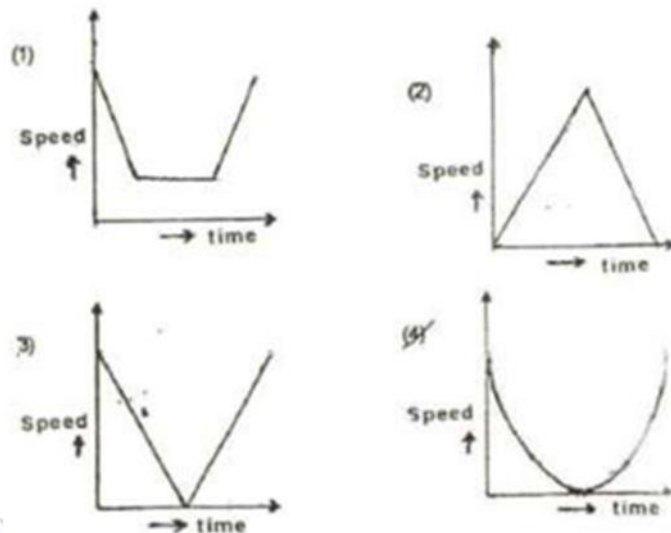
(3) Both are changing

(4) All the above options are correct

Ans. 4

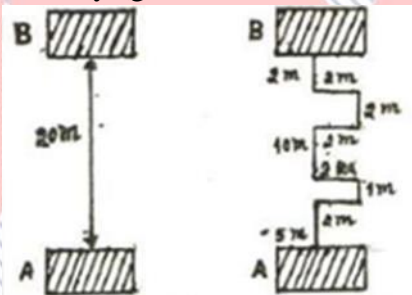
Acceleration depends upon magnitude and direction of velocity.

71. Which graph represents the case of a cricket ball thrown vertically upwards is returning to the hands of the thrower:



Ans. 3

72. In upward motion ; $V = u - gt$ graph will be straight line with -ve slope; in downward motion, $V = gt$ graph will be straight line with +ve slope.
Work done in lifting the object of mass 1 kg from point A to point B in both the situations respectively ($g = 9.8 \text{ m/sec}^2$) is:

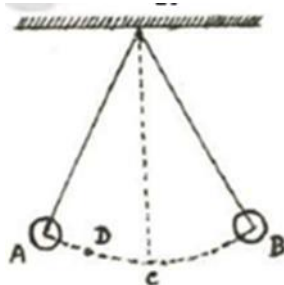


- (1) 196 J, 294 J
(3) 294 J, 196 J

- (2) 196 J, 196 J
(4) 0 J, 0 J

Ans. 2

73. Work done is change in gravitational potential energy and G.P.E. is independent of path $W = mgh = 1 \times 9.8 \times 20 = 196 \text{ j}$ in both cases A pendulum bob is oscillating. In which position does it has maximum kinetic energy:



- (1) at A
(3) at C

- (2) at B
(4) at D

Ans. 3

K.E. of a pendulum bob is maximum at mean position.

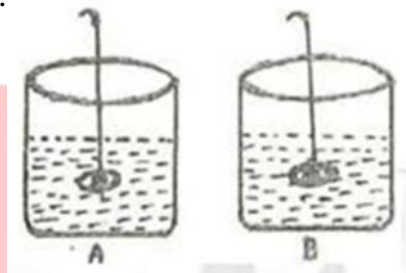
74. An object of mass 'm' is moving with a constant velocity V. How much work should be done on it to stop it?

- (1) mv (2) mv^2
(3) $\frac{m^2v}{2}$ (4) $\frac{1}{2}mv^2$

Ans. 4

$$= \Delta K.E = \frac{1}{2}mv^2 - 0 \equiv \frac{1}{2}mv^2$$

75. A stone is tied to a thread and is immersed in two different beakers completely. Both the beakers were filled with the same level of liquid. On measuring with the help of a spring balance, it was found that the weight of the stone in beaker A was more than that in beaker B. The reason is:



- (1) Density of liquid A is more than B.
(2) Density of liquid B is more than A.
(3) Both the liquids have the same density.
(4) None of the above

Ans. 2

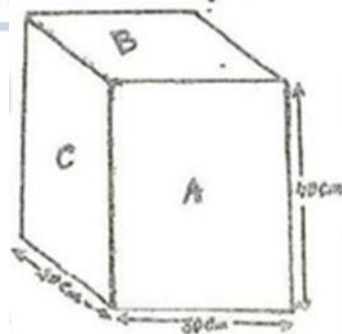
$$W_A = mg - B_A \text{ and } W_B = mg - B_B$$

$$\text{If } W_A > W_B \text{ then } B_A < B_B$$

$$\Rightarrow V\rho_A g < V\rho_B g$$

$$\Rightarrow \rho_A < \rho_B$$

76. The pressure exerted by the shown wooden block on a surface will be highest when:



- (1) B Surface is downward (2) A Surface is downward
(3) C Surface is downward (4) None of the above

Ans. 1

$$P = F/A$$

Surface B has minimum area it means maximum pressure.

77. The perpendicular force acting on a surface is called:
- | | |
|----------------------|-----------------------|
| (1) Frictional force | (2) Centripetal force |
| (3) Thrust | (4) Magnetic force |

78. Unit of Relative Density is:

- | | |
|----------------------|---------------------|
| (1) kg/m^3 | (2) kg m^3 |
| (3) kg/cm^3 | (4) No unit |

79. 50 gm of a substance has a volume of 20 cm^3 . The density of water is 1 gm/cm^3 , then it will

- | |
|---|
| (1) Float on water: |
| (2) Sink in water |
| (3) Will move up and down in water |
| (4) Half of it will be immersed and half of it will be above the surface of water |

Ans. 2

$$\rho_{\text{substance}} = \frac{50}{20} = 2.5 \text{ gm / cc}$$

Density of substance is greater than density of water. Hence, substance will sink.

80. A car is moving with a velocity of 10 m/sec . Its mass is 1000 kg . If the velocity-time graph for this car is a horizontal line parallel to the time axis, then the velocity of car at the end of 25 sec . will be:

- | | |
|------------------------|-------------------------|
| (1) 25 m/sec | (2) 40 m/sec |
| (3) 10 m/sec | (4) 250 m/sec |

Ans. 3

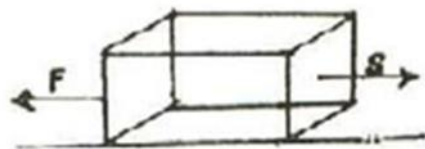
Since V - t graph is parallel to time axis hence car has constant velocity.

81. In the diagram shown, the work done by the force will be:

- | | |
|--------------|-----------------------|
| (1) Positive | (2) Negative |
| (3) Zero | (4) None of the above |

Ans. 2

Force and displacement are in opposite direction hence work done will be negative. 



82. According to 3rd Law of Motion which one of the following statement is not true?
- (1) When one object applies force on the other, the other also applies force on the first object simultaneously
 - (2) Magnitude of both the force is same.
 - (3) Direction of both the forces is opposite
 - (4) Both the forces act on one object but in opposite direction

According to Newton's 3rd law action and reaction acts on different objects.

83. A ball is thrown up with a speed of 15 m/sec. How high will it go before it begins to fall? ($g = 9.8 \text{ m/sec}^2$)
- (1) 22.8 m
 - (2) 13.9 m
 - (3) 17.2 m
 - (4) 11.4 m

Ans. 4

$$h = \frac{v^2}{2g} = \frac{15 \times 15}{2 \times 9.8} = 11.4 \text{ m}$$

84. The unit of measuring momentum per unit time of a moving body is:
- (1) m sec^{-1}
 - (2) kg m sec^{-1}
 - (3) Newton
 - (4) $\text{Nm}^2 \text{kg}^{-2}$
85. When sound waves travel from air to water then the quantity which does not changes is
- (1) Velocity
 - (2) Frequency
 - (3) Wavelength
 - (4) Loudness

Ans. 2

Frequency of sound wave is independent of medium.

86. Which one is true statement?
- (1) Light and sound waves both are transverse in nature.
 - (2) Light and Sound waves are longitudinal in nature
 - (3) Light and Sound waves can propagate in space (vacuum)
 - (4) Light wave is transverse and sound wave is longitudinal in nature

Ans. 4

87. If a thunder is heard by a man 4 seconds after the lightning is seen, how far is lightning from the man: (speed of sound in air = 330 m/sec)
- (1) 660 m
 - (2) 1320 m
 - (3) 1450 m
 - (4) 1920 m

Ans. 2

$$d = v \times t = 330 \times 4 = 1320 \text{ m}$$

88. An object of weight 20 N is taken from equator to Pole. Find change in mass of the object: ($g = 10 \text{ m/sec}^2$)
- (1) 2 kg (2) zero
 (3) 2 N (4) 10 N

Ans. 2

Mass of object remains same.

89. An object falls freely towards earth. If air friction is considered then total energy of object
- (1) Increases (2) Decreases
 (3) Remains constant (4) First increases and then decreases

Ans. 2

There is loss of energy due to work done against air friction.

90. An athlete takes 40 sec. to move in a circular path of diameter 200 m. What will be his displacement after 2 min. 20 sec.
- (1) 100 m (2) 200 m
 (3) 0 m (4) 400 m

Ans. 2

After 2 minutes 20 seconds athlete will be diametrically opposite side of circular path. Hence, displacement will be equal to diameter of circular path.

