

# MECHANICS (MASS, FORCE, ACCELERATION, WORK, ENERGY, MOMENTUM, VELOCITY) BASED GENERAL SCIENCE MCQ PRACTICE QUESTIONS AND ANSWERS PDF WITH EXPLANATION

For All Competitive SSC, Bank, IBPS, UPSC, Railway, IT & Other Govt. Exams

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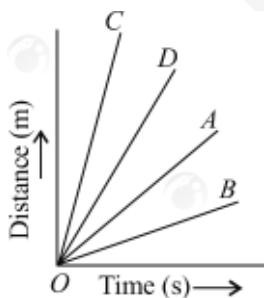
**Q1.** If an object having mass of 1 kg is subjected to a force of 1 N it moves with

- a) an acceleration of  $10 \text{ m/s}^2$
- b) a speed of 1 km/s
- c) a speed of 1 m/s
- d) an acceleration of  $1 \text{ m/s}^2$

**Q2.** Two bodies A and B have masses  $M$  and  $m$  respectively where  $M > m$  and they are at a distance  $d$  apart. Equal force is applied to them so that they approach each other. The position where they hit each other is

- a) at equal distance from A and B
- b) nearer to A
- c) nearer to B
- d) cannot be determined

**Q3.** Four cars A, B, C and D are moving on a levelled road. Their distance versus time graphs are shown in figure. Choose the correct statement.



- a) Car C is faster than car D.
- b) Car B is the slowest.

- c) Car A is faster than car D
  - d) Car C is the lowest.
- 

**Q4.** Which one of the following is a vector quantity?

- a) Energy
- b) Pressure
- c) Momentum
- d) Work

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**Q5.** The relative velocity  $v_{AB}$  or  $v_{BA}$  of two bodies A and B may be

- 1. greater than the velocity of body A
  - 2. greater than the velocity of body B
  - 3. less than the velocity of body A
  - 4. less than the velocity of body B
- a) (1), (2) and (3) only
  - b) (3) and (4) only
  - c) (1) and (2) only
  - d) (1), (2), (3) and (4).
- 

**Q6.** A balloon filled with  $\text{CO}_2$  released on earth would (neglect viscosity of air)

- a) fall with a constant acceleration  $3.4 \text{ m/s}^2$
  - b) fall with an acceleration  $9.8 \text{ m/s}^2$
  - c) climb with an acceleration  $9.8 \text{ m/s}^2$
  - d) fall with acceleration and then would attain a constant velocity
-

**Q7.** A passenger in a moving train tosses a coin. If the coin falls behind him, the train must be moving with

- a) a uniform speed
  - b) a deceleration
  - c) an acceleration
  - d) any of the above
- 

**Q8.** A man waves his arms while walking. This is to

- a) increase the velocity
  - b) ease the tension
  - c) keep constant velocity
  - d) balance the effect of earth's gravity
- 

**Q9.** When a stone tied to a string is whirled in a circle, the work done on it by the string is

- a) zero
  - b) negative
  - c) positive
  - d) undefined
- 

**Q10.** In case of negative work the angle between the force and displacement is

- a)  $90^\circ$
  - b)  $45^\circ$
  - c)  $0^\circ$
  - d)  $180^\circ$
- 

**Q11.** The circular motion of a particle with constant speed is

- a) periodic and simple harmonic
  - b) periodic but not simple harmonic
  - c) simple harmonic but not periodic
  - d) neither periodic nor simple harmonic
- 

**Q12.** The potential energy is always the same for an object with the same

- a) Acceleration
- b) Speed
- c) Velocity
- d) Position

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**Q13.** Consider the following statements :

- The objects appear to be more heavy when submerged in water than they are in air.
- A needle placed carefully on the surface of water may float, whereas a ball of the same material will always sink.

Which of these statements is/are **correct** ?

- a) 1 and 2 both
  - b) 1 only
  - c) 2 only
  - d) None
- 

**Q14.** An oil tanker is partially filled with oil and moves forward on a level road with uniform acceleration. The free surface of oil, then

- a) is inclined to the horizontal with larger depth at the rear end
- b) is inclined to the horizontal with smaller depth at the rear end
- c) remains horizontal

d) assumes parabolic curve

**Q15.** An athlete diving off a high springboard can perform a variety of exercises in the air before entering the water below. Which one of the following parameters will remain constant during the fall?

- a) The athlete's kinetic energy
- b) The athlete's moment of inertia
- c) The athlete's linear momentum
- d) The athlete's angular momentum

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**Answers to the above questions :**

**Q1. Answer: (d)**

**Q2. Answer: (b)**

As net external force on the system is zero therefore position of their centre of mass remains unaffected i.e. they will hit each other at the point of centre of mass. The centre of mass of the system lies nearer to A because  $MA > MB$ .

**Q3. Answer: (b,**

**c)**

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**Q4. Answer: (c)**

**Q5. Answer: (d)**

All options are correct :

(i) When two bodies A & B move in opposite directions then the relative velocity between A & B either  $v_{AB}$  or  $v_{BA}$  both are greater than  $v_A$  &  $v_B$  .

(ii) When two bodies A & B move in parallel direction then

$$v_{AB} = v_A - v_B \quad ? \quad v_{AB} < v_A$$

$$v_{BA} = v_B - v_A \quad ? \quad v_{BA} < v_B$$

**Q6. Answer: (a)**

If B is upthrust of air on balloon, and a is downward acceleration, then

$$Mg - B = Ma$$

$$? \quad a = \frac{Mg - B}{M} = g - \frac{V_{air}g}{V_{CO_2}}$$

$$= (1 - \frac{V_{air}}{V_{CO_2}})g = (1 - \frac{28.8}{44}) \times 9.8 \text{ m/s}^2$$

$$= 3.4 \text{ m/s}^2$$

**Q7. Answer: (c)**

**Q8. Answer: (d)**

**Q9. Answer: (a)**

**Q10. Answer: (d)**

**Q11. Answer: (b)**

In the circular motion of a particle with constant speed, the particle repeats its motion after a regular interval of time but does not oscillate about a fixed point.

So, the motion of particles is periodic but not simple harmonic.

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**Q12. Answer: (d)**

**Q13. Answer: (c)**

Buoyancy is an upward force exerted by a liquid, gas or other fluid, that opposes the weight of an immersed object.

**Q14. Answer: (d)**

**Q15. Answer: (d)**

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