

**CLASS XI - PHYSICS****❖ General instructions:**

- 1) All the questions are compulsory.
- 2) Q No.1 to 4 are multiple choice questions carrying 1 mark each. Q No. 5 is a case Based Question carrying 2 marks. Q No. 6 to 8 are assertion reason based question carrying 1 mark each.
- 3) Q No. 9 to 11 are short answer type question carrying 3 marks each. Q No. 12 is of 2 mark.
- 4) There is no overall choice. There are 33 questions in all. All questions are compulsory.

- Q1. The force required to produce an acceleration of  $2 \text{ m/s}^2$  on a mass of 2 kg is  
(a) 4 N      (b) 10 N      (c) 22 N      (d) 18 N
- Q2. A passenger in a moving bus is thrown forward when the bus is suddenly stopped. This is explained  
(a) by Newtons first law  
(b) by Newtons second law  
(c) by Newtons third law  
(d) by the principle of conservation of kinetic energy
- Q3. A body of mass 10 kg is travelling with uniform speed of 5 m/s. Its kinetic energy is  
(a) 25 J      (b) 125 J  
(c) 1250 J      (d) 1000 J
- Q4. No work is done if  
(a) displacement is zero  
(b) force is zero  
(c) force and displacement are mutually perpendicular  
(d) All of these

**Case Based Questions:****Q5. Conservation of Momentum**

This principle is a consequence of Newton's second and third laws of motion. In an isolated system (i.e. system having no external force), mutual forces (called internal forces) between pairs of particles in ne

system causes momentum change in individual particles. Let a bomb be at rest, then its momentum will be zero. If the bomb explodes into two equal parts, then the parts fly off in exactly opposite reactions with same speed, so that the total momentum is still zero. Here, no external force is applied the system of particles (bomb).

- (i) A bullet of mass 10 g is fired from a gun of mass 1 kg with recoil velocity of gun 5 m/s. The muzzle velocity will be
- (a) 30 km/min                      (b) 60 km/min  
(c) 30 m/s                         (d) 500 m/s
- (ii) Two masses of  $M$  and  $4M$  are moving with equal kinetic energy. The ratio of their linear momenta is
- (a) 1:8                                (b) 1:4  
(c) 1:2                                (d) 4:1

Directions: Each of these questions contain two statements, Assertion and Reason. Each of these questions also has four alternative choices, only one of which is the correct answer. You have to select one of the codes (a), (b), (c) and (d) given below.

- (a) Assertion is correct, reason is correct; reason is a correct explanation for assertion.  
(b) Assertion is correct, reason is correct; reason is not a correct explanation for assertion  
(c) Assertion is correct, reason is incorrect  
(d) Assertion is incorrect, reason is correct.

Assertion -Reason based questions:

- Q6. Assertion: A spring has potential energy, both when it is compressed or stretched.  
Reason: In compressing or stretching, work is done on the spring against the restoring force..
- Q7. Assertion: A force applied on the body always does work on the body.  
Reason: If a force applied on a body displaces the body along the direction of force work done will be maximum.

Q8. Assertion: The work done in moving a body over a closed loop is zero for every force in nature.

Reason: Work done depends on nature of force.

Q9. State and prove work energy theorem.

Q10. Derive first law and third law of motion from Newton's second law.

Q11. State laws of limiting friction.

Q12. A monkey of mass 40 kg climbs on a rope which can stand a maximum tension of 600 N. In which of the following cases will the rope break: the monkey

(a) climbs up with an acceleration of 6 ms<sup>-2</sup>

(b) climbs down with an acceleration of 4 ms<sup>-2</sup>

(c) climbs up with a uniform speed of 5 ms<sup>-1</sup>

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