CHAPTER = 3 DYNAMICS

MULTIPLE CHOICE QUESTIONS (BOOK 11)

1 The rate of change of linear momentum of a body is called a:

a) Linear force b) Angular force c) Power d) Impulse

2 The term mass refers to the same physical concept as:

a) weight *b) inertia* c) force d) acceleration

3 Which one of the following forces is also called as self-adjusting force

a) frictional force b) tension c) Weight d) Thrust

4 The laws of motion show the relationship between:

a) velocity and acceleration b) mass and velocity

c) mass and acceleration d) force and acceleration

5 The motion of a rocket in space is according to the law of conservation of:

a) Energy *b) linear momentum*

c) mass d) angular momentum

6 A bomb of mass 12 kg initially at rest explodes into two pieces of masses 4 kg and 8 kg. The speed of 8 kg mass is 6 m/s. The kinetic energy of 4 kg mass is:

a) 32 J b) 48J c) 114 J *d) 288J*

7 If momentum is increased by 20% then K.E increases by:

a) 44% b) 55% c) 66% d) 77%

8 The kinetic energy of a body of mass 2kg and momentum of 2Ns is:

A) 1 J b) 2 J c) 3 J d) 4 J

9 For the same kinetic energy, the momentum is maximum for:

a) an electron b) a proton c) a deuteron *d) alpha particle*

10. A 3kg bowling ball experiences a net force of l5N. What will be its acceleration?

a) 35 m/s^2 b) 7 m/s^2 *c) 5 m/s^2* d) 35 m/s^2

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EXAMS PRACTICE MULTIPLE CHOICE QUESTIONS

1 In an elastic collision of two particles, the following is conserved
(a) The speed of each particle
(b) The kinetic energy of each particle
(c) The total kinetic energy of both the particles
(d) Momentum of each particle

2 A shell initially at rest explodes into two pieces of equal mass, then the two pieces will
(a) Move with different velocities in different directions
(b) Be at rest
(c) Move with the same velocity in the same direction
(d) Move with the same velocity in opposite directions

3 A body of mass M collides against a wall with a velocity V and retraces its path with the same speed. The change in momentum is (take the initial direction of the velocity as positive)
(a) 2 Mv (b) 1 Mv
(c) -2 Mv (d) Zero

4 Which of the following does not remain conserved in an inelastic collision?
(a) Momentum **(b) kinetic energy**
(c) Total energy (d) Neither momentum nor kinetic energy

5 When two bodies stick together after the collision, the collision is said to be
(a) partially elastic (b) elastic
(c) inelastic **(d) perfectly inelastic**

6 A metal ball of mass 2 kg moving with a velocity of 36 km/h has a head on collision with a stationary ball of mass 3 kg. If after the collision, the two balls move together, the loss in kinetic energy due to collision is
(a) 140 J (b) 100 J
(c) 60 J (d) 40 J

7 A body of mass m moving with a constant velocity v hits another body of the same mass moving with the same velocity v but in the opposite direction and sticks to it. The velocity of the compound body after the collision is
(a) 2v (a) v/2
(a) V **(a) Zero**

9 In an elastic collision:
(a) Kinetic energy is conserved but momentum is not conserved
(b) Momentum is conserved but kinetic energy is not conserved
(c) Both momentum and kinetic energy are conserved
(d) Neither kinetic energy nor momentum is conserved

10 The unit of linear momentum is:

(a) N/s **(b) Ns**

(c) Js (d) J/s

11 The rate of change of linear momentum is equal to:

(a) Acceleration **(b) Force** **(c)** Torque **(a)** work

12 The dimensions of linear momentum are:

(a) MLT^{-1} **(b)** ML^2T^{-1}

(c) MLT^2 (c) $M^2L^2T^{-1}$

13 If the speed of the moving body is halved, its kinetic energy becomes:

(a) one fourth **(b)** Half

(c) Three times (d) Four times

14 If the velocity of a body is doubled and mass is reduced to one-fourth of its initial value, the K.E is:

(a) Doubled **(b)** Four-fold

(c) Same (d) Halved

15 A player catches a ball of mass 150 gm moving at a rate of 20 m/s. If the process of catching is to be completed in 0.1 sec. What is the force exerted by the ball on the hands of the player?

(a) 3000 N (b) 300 N

(c) 30 N (d) 0.3 N

16 When a force acts on a ball of mass 150 g for 0.1 sec, it produces an acceleration of 20 m/s^2. What is the value of this impulsive force?

(a) 0.5 N-s **(b) 0.3 N-s**

(c) 0.1 N-s (d) 1.2 N-s

17 A bullet of mass 5 gm is fired from a gun of mass 5 kg. What is the velocity of the muzzle if the recoil velocity is 500 m/s.

(a) 500 m/s (b) 5 m/s

(c) 50 m/s **(d) 0.5 m/s**

18 A heavy object and a light object have the same momentum. Which has the greater speed?

(a) a heavy object **(b) light object**

(c) both have the same speed

(d) the heavy object has a zero speed while the light object has a nonzero speed

19 A 1500 kg truck traveling at 80 km/h collides with another car of mass 1000 kg traveling at 30 km/h in the same direction. The two cars stick together after the collision. Their speed immediately after the collision is

(a) 30 km/h (b) 40 km/h

(c) 50 km/h **(d) 60 km/h**

20 A baseball player grabs a 200-gram baseball which is moving at a speed of 30 m/s. The ball comes to rest in about 1/10 second. The force acting on the player's hand is (Think of the relationship between change of the momentum and force),

(a) 60 N (b) 200 grams

(c) 30 m/s (d) 2000 N