EXERCISE-1

A. Very Short Answer Type Questions

Q.1 State Newton's third law.

Q.2 What is the unit of momentum ?

Q.3 Name and state the action and reaction in the following cases :

(i) Firing a bullet from a gun.

(ii) Hammering a nail.

(iii) A book lying on a table.

(iv) A moving rocket.

(v) A person walking on the floor.

(vi) A moving train colliding with a stationary train.

Q.4 Why a gun recoils when a bullet is fired ?

Q.5 Define the term force.

Q.6 What do you mean by inertia ?

Q.7 Why are tyres made rough ?

Q.8 Why does a glass filled with water feel lighter inside a water containing tank ?

Q.9 Explain the term friction.

Q.10 Define thrust. Give the S.I. unit of thrust.

Q.11 Define pressure. Give the S.I. unit of pressure.

Q.12 Calculate the pressure when a force of 50 N is applied on an area of 0.5 m^2.

Q.13 Do the liquids exert pressure ?

Q.14 Why does a sharp knife cuts objects more easily than a blunt knife ?

Q.15 In what direction the buoyant force of a liquid acts ?

Q.16 What is the relation between the buoyant force on a body and the liquid displaced by it ?

Q.17 A feather and a stone of same mass fall with different rates in the air. Why ?

Q.18 State Archimedes' Principle.

B. Short Answer Type Questions

Q.19 Enunciate the Newton's first law of motion.

Q.20 State and explain the law of inertia.

Q.21 Why it is advised to tie the luggage with a rope on the roof of the buses ?

Q.22 Why it is difficult for a fireman to hold a hose, which ejects water at a high velocity ?

Q.23 State Newton's third law of motion. Give two examples.

Q.24 When a shot is fired from a gun, the gun recoils. Explain.

Q.25 Discuss the law of conservation of momentum.

Q.26 A bullet of mass 20 gm moving with a velocity of 100 m/s strikes a wooden block of mass 800 gm and gets embedded into it. Calculate velocity of the combined system.

Q.27 Explain why it is easier to stop a tennis ball in comparison to a cricket ball moving with the same speed ?

Q.28 A force of 20 N acts on a body of mass 4 kg for 5 s initially at rest. Calculate the velocity acquired by the body and change in momentum of the body.

Q.29 A cricket ball of mass 100 gm moving with a speed of 40 ms^{-1} is brought to rest by a player in 0.02s. Find the average force applied by the player.

Q.30 Describe the laws of liquid pressure.

Q.31 Explain the term fluid.

Q.32 Explain the term buoyancy.

Q.33 While drawing water with the help of a bucket from a well, the bucket appears to be heavy when comes out of water. Why ?

Q.34 A body weighs 8.6 N in air and 6.8 N when fully immersed in water. Calculate the buoyant force.

Q.35 A metal object when fully immersed in water, displaces 2 litres of water. What is the loss in its weight in water ? Also, calculate the buoyant force.

Q.36 Define the term density. Give its units in SI and in CGS systems.

Q.37 Define the term relative density. Calculate the relative density of a substance if its density is 8.2 gm/cm^3.

C. Long Answer Type Questions

Q.38 A piece of wood or cork immersed into water and left, comes back to the surface. Explain why ?

Q.39 A piece of metal weighs 48.5 gmf in air, 42.0 gmf in water and 44.5 gmf in a liquid. Determine relative densities of metal and liquid.

Q.40 Why the accidents occurred due to high speeds have worst result than the accidents occurred at low speeds ?

EXERCISE-2

Single Correct Answer Type Questions

Q.1 If A and B are two objects with masses 10 kg and 30 kg respectively then :
(A) A has more inertia than B
(B) B has more inertia than A
(C) A and B have the same inertia
(D) none of the two have inertia

Q.2 First law of motion defines-
(A) inertia
(B) force
(C) both inertia and force
(D) neither inertia nor force

Q.3 Newton's first law of motion is -
(A) qualitative
(B) quantitative
(C) both qualitative and quantitative
(D) neither qualitative nor quantitative

Q.4 Inertia depends upon -
(A) acceleration of the body
(B) velocity of the body
(C) shape of the body
(D) mass of the body

Q.5 Which of the following has largest inertia?
(A) A pin
(B) An ink pot
(C) Your physics book
(D) Your body

Q.6 When a bus starts suddenly the passengers standing on it, lean backwards in the bus. This is an example of -
(A) Newton's first law
(B) Newton's second law
(C) Newton's third law
(D) none of Newton's law

Q.7 The law which defines force is -
(A) Newton's third law
(B) Newton's first law
(C) Newton's second law
(D) none of these

Q.8 Inertia of rest is the property by virtue of which the body is unable to change by itself:
(A) the state of rest only
(B) the state of uniform linear motion
(C) the direction of motion only
(D) the steady state of rest

Q.9 An iron ball and aluminium ball has same mass:
(A) inertia of iron is greater than aluminium
(B) both the ball have same inertia
(C) inertia of iron is less than that of Aluminium
(D) none of these

Q.10 Mass measures amount of .....in a body-
(A) inertia (B) motion
(C) velocity (D) acceleration

Q.11 Newton's second law of motion-
(A) defines force
(B) defines inertia
(C) gives measure of force
(D) none of these

Q.12 Newton's second law of motion is -
(A) qualitative
(B) quantitative
(C) both qualitative and quantitative
(D) neither qualitative nor quantitative

Q.13 Momentum measures amount of ..... in a body-
(A) inertia (B) motion
(C) velocity (D) acceleration

Q.14 Force measures rate of change of ..... a body
(A) mass (B) inertia
(C) velocity (D) momentum

Q.15 C.G.S. unit of force is -
(A) m/s (B) s/m
(C) dyne (D) Newton

Q.16 Momentum has same unit as -
(A) impulse (B) torque
(C) moment of force (D) couple

Q.17. When force of 1 N acts on mass of 1 kg, which is able to move freely, the object moves with a/an -
(A) speed of 1 ms^{-1}
(B) speed of 1 kms^{-1}
(C) acceleration of 10 ms^{-2}
(D) acceleration of 1 ms^{-2}

Q.18 The net force acting on a body of mass of 1 kg moving with a uniform velocity of 5 ms^{-1} is -
(A) 5 N (B) 0.2 N
(C) 0 N (D) None of these

Q.19 A body of mass 20 kg moves with an acceleration of $2ms^{-2}$. The rate of change of momentum in S.I. unit is -
(A) 40 (B) 10
(C) 4 (D) 1

Q.20 A body of mass M strikes against wall with a velocity v and rebounds with the same velocity. Its change in momentum is -
(A) zero (B) Mv
(C) –Mv (D) –2 Mv

Q.21 Gram weight is a unit of-
(A) mass (B) weight
(C) A and B both (D) neither A nor B

Q.22 9.8 N is equal to-
(A) 1 kgf (B) 1 kgwt
(C) A and B both (D) Neither A nor B

Q.23 A body of mass 5 kg undergoes a change in speed from 20 m/s to 0.20 m/s. The momentum-
(A) increases by 99 kgm/s
(B) decreases by 99 kgm/s
(C) increases by 101 kgm/s
(D) decreases by 101 kgm/s

Q.24 The combined effect of mass and velocity is taken into account by a physical quantity called
(A) torque (B) moment of force
(C) momentum (D) all of them

Q.25 How many dynes are equal to 1 N ?
(A) 10^6 (B) 10^4
(C) 10^5 (D) 10^3

Q.26 Choose correct relation :
(A) a = F/m (B)aF = m
(C) m = F × a (D) none of these

Q.27 If a moving ball A collides with another moving ball B, then
(A) momentum of A = momentum of B
(B) (momentum A + momentum of B) before collision = (momentum A + momentum of B) after collision
(C) neither A nor B
(D) A or B both are possible

Q.28. When a bullet is fired from a gun. The gun recoils to -
(A) conserve mass
(B) conserve momentum
(C) conserve K.E
(D) none of these

Q.29 A bullet in motion hits and gets embedded in a solid resting on a frictionless table. What is conserved ?
(A) Momentum and K.E.
(B) Momentum alone
(C) K.E. alone
(D) None of these

Q.30 A bullet of mass 0.01 kg is fired from a gun weighing 5.0 kg. If the initial speed of the bullet is 250 m/s, calculate the speed with which the gun recoils-
(A) – 0.50 m/s (B) – 0.25 m/s
(C) + 0.05 m/s (D) + 0.25 m/s

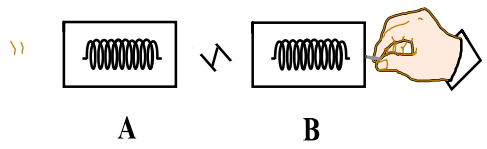
Q.31 Forces of action and reaction are:
(A) equal and in same direction
(B) equal and in opposite direction
(C) unequal and in same direction
(D) unequal and opposite.

Q.32 Forces of action and reaction -
(A) one after the other on same body
(B) simultaneously on same body
(C) one after the other on different bodies
(D) simultaneously on different bodies

Q.33 A man is standing on a boat in still water. If he walks towards the shore the boat will -
(A) move away from the shore
(B) remain stationary
(C) move towards the shore
(D) sink

Q.34 If the action and reaction were to act on the same body-
(A) the resultant would be zero
(B) the body would not move at all
(C) both A and B are correct
(D) neither A nor B is correct

Q.35 Consider two spring balances hooked as shown in the figure. We pull them in opposite directions. If the reading shown by A is 1.5 N, the reading shown by B will be -



(A) 1.5 N (B) 2.5 N
(C) 3.0 N (D) zero

Q.36 Newton used, 'quantity of motion' for-
(A) momentum
(B) force
(C) acceleration due to gravity
(D) none of these

Q.37 A cannon after firing recoils due to -
(A) conservation of energy
(B) backward thrust of gases produced
(C) Newton's first law of motion
(D) Newton's third law of motion

Q.38 A Diwali rocket is ejecting 0.05 kg of gases per second at a velocity of 400 ms^{-1}. The accelerating force on the rocket is:
(A) 20 dyne
(B) 20 Newton
(C) 20 kg wt.
(D) sufficient data not given

Q.39 The forces of action and reaction have ..... magnitude but ..... direction-
(A) same, same (B) same, opposite
(C) opposite, same (D) opposite, opposite

Q.40 Choose correct statement-
(A) Action and reaction forces act on same object.
(B) Action and reaction forces act on different objects.
(C) A and B both are possible.
(D) Neither A nor B is correct.

ANSWER KEY

EXERCISE - 1

12. 100 N/m^2 m/sec **13.** Yes **26.** 2.43 m/sec **28.**25m/s, 100kg

29. 200 N **34.** 1.B N

EXERCISE - 2

Ques	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**	**13**	**14**	**15**
Ans	B	C	A	D	D	A	B	D	B	A	C	B	B	D	C
Ques	**16**	**17**	**18**	**19**	**20**	**21**	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
Ans	A	D	C	A	D	B	C	B	C	C	A	B	B	B	A
Ques	**31**	**32**	**33**	**34**	**35**	**36**	**37**	**38**	**39**	**40**					
Ans	B	D	A	C	A	A	D	B	B	B					