NEET : CHAPTER WISE TEST-4

SUBJECT :- PHYSICS **DATE.....**

CLASS :- 11th **NAME.....**

CHAPTER :- NEWTON'S LAWS OF MOTION **SECTION.....**

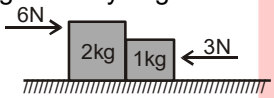
(SECTION-A)

1. When a body is stationary-
(A) There is no force acting on it
(B) The force acting on it not in contact with it
(C) The combination of forces acting on it balances each other
(D) The body is in vaccum

2. Newton's Third law is equivalent to the-
(A) law of conservation of linear momentum
(B) law of conservation of angular momentum
(C) law of conservation of energy
(D) law of conservation of energy and mass

3. In the case of horse pulling a cart, the force that causes the horse to move forward is the force that :
(A) the horse exerts on the ground
(B) the horse exerts on the cart
(C) the ground exerts on the horse
(D) the cart exerts on the horse

4. Two forces of 6N and 3N are acting on the two blocks of 2kg and 1kg kept on frictionless floor. What is the force exerted on 2kg block by 1kg block ?



(A) 1N (B) 2N (C) 4N (D) 5N

5. A force of 6N acts on a body at rest of mass 1 kg. During this time, the body attains a velocity of 30 m/s. The time for which the force acts on the body is-
(A) 10 seconds (B) 8 seconds
(C) 7 seconds (D) 5 seconds

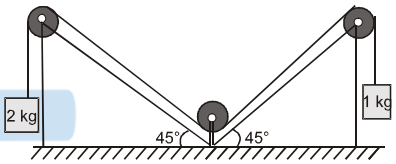
6. A bird weighing 1 kg sitting on the base of a wire mesh cage weighing 1.5 kg. The bird starts flying in the cage. The weight of the bird cage assembly will be
(A) 1250 g (B) 1500 g
(C) 1750 g (D) None of these

7. A boy having a mass equal to 40 kilograms is standing in an elevator. The force felt by the feet of the boy will be greatest when the elevator (g = 9.8 metre/sec^2)-
(A) Stands still
(B) Moves downwards at a constant velocity of 4 metre/sec.
(C) Accelerates downward with an acceleration equal to 4 metres/sec^2
(D) Accelerates upward with an acceleration equal to 4 metres/sec^2

8. A man weighs 80 kg. He stands on a weighing scale in a lift which is moving upwards with a uniform acceleration of 5 m/s^2. What would be the reading on the scale ? (g = 10 m/s^2)
(A) 800 N (B) 1200 N
(C) Zero (D) 400 N

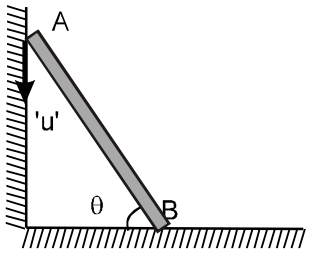
9. A uniform thick rope of length 5m is kept on frictionless surface and a force of 5N is applied to one of its end. Find tension in the rope at 1m from this end-
(A) 1N (B) 3N (C) 4N (D) 5N

10. For the arraangement shown in figure, pulleys and strings are ideal Find out the acceleration of 2 kg block



(A) $\frac{g}{3}$ (B) $\frac{g\sqrt{2}}{3}$
(C) $\frac{2g}{3}$ (D) $\frac{2g}{\sqrt{2}}$

11. The velocity of end 'A' of rigid rod placed between two smooth vertical walls moves with velocity 'u' along vertical direction. The velocity of end 'B' of that rod, rod always remains in contact with the vertical walls.



(A) u cot θ (B) u tan θ
(C) u sin θ (D) u cos θ

12. The linear momentum P of a body varies with time and is given by the equation P = x + yt^2 where x and y are constants. The net force acting on the body for a one dimensional motion is proportional to-
(A) t^2 (B) a constant
(C) $\frac{1}{t}$ (D) t

13. The average force necessary to stop a hammer having momentum 25 N-s in 0.05 second is-
(A) 25 N (B) 50 N
(C) 1.25 N (D) 500 N

14. The mass of ship is 2×10^7 kg. On applying a force of 25×10^5 N, it is displaced through 25m. After the displacement, the speed acquired by the ship will be:
(A) 12.5 m/s (B) 5 m/s
(C) 3.7 m/s (D) 2.5 m/s

15. A body of mass 0.1 kg attains a velocity of 10 ms^{-1} in 0.1 s. The force acting on the body is :
(A) 10 N (B) 0.01 N
(C) 0.1 N (D) 100 N

16. A diwali rocket is ejecting 0.05 kg of gases per second at a velocity of 400 m/sec. The accelerating force on the rocket is
(A) 20 dynes (B) 20 N
(C) 22 dynes (D) 1000 N

17. A player takes 0.1 s in catching a ball of mass 150 g moving with velocity of 20 m/s. The force imparted by the ball on the hands of the player is :
(A) 0.3 N (B) 3 N
(C) 30 N (D) 300 N

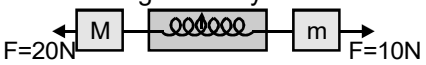
18. A lift of mass 1000 kg is moving upwards with an acceleration of 1 m/s^2. The tension developed in the string, which is connected to lift is : (g = 9.8 m/s^2)
(A) 9800 N (B) 10800 N
(C) 11000 N (D) 10000 N

19. A body of mass 0.1 kg attains a velocity of 10 ms^{-1}. in 0.1 s. The force acting on the body is :
(A) 10 N (B) 0.01 N
(C) 0.1 N (D) 100 N

20. A monkey of mass 20 kg is holding a vertical rope. The rope will not break when a mass of 25 kg is suspended from it but will break if the mass exceeds 25 kg. What is the maximum acceleration with which the monkey can climb up along the rope ? (g = 10 m/s^2)
(A) 25 m/s^2 (B) 2.5 m/s^2
(C) 5 m/s^2 (D) 10 m/s^2

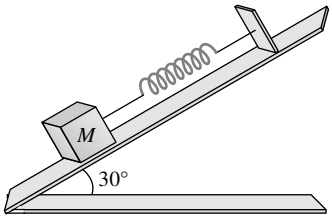
21. A spring toy weighing 1 kg on a spring balance suddenly jumps upward. A boy standing near the toy notices that the scale of the balance reads 1.05 kg. In this process the maximum acceleration of the toy is- (g = 10m sec^{-2})
(A) 0.05 m sec^{-2} (B) 0.5 m sec^{-2}
(C) 1.05 m sec^{-2} (D) 1 m sec^{-2}

22. A dynamometer D, is connected with to bodies of mass M = 6 kg and m = 4kg. If two forces F = 20 N & F = 10 N are applied on masses according to figure then reading of the dynamometer will be -



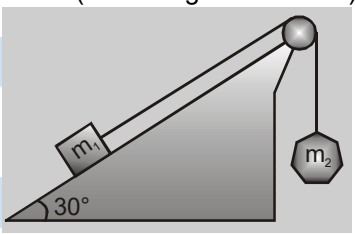
(A) 10 N (B) 20 N
(C) 6 N (D) 14 N

23. A body of mass 5*kg* is suspended by a spring balance on an inclined plane as shown in figure. The spring balance measure



(A) 50 *N* (B) 25 *N*
(C) 500 *N* (D) 10 *N*

24. A block of mass m_1 = 2 kg on a smooth inclined plane at angle 30° is connected to a second block of mass m_2 = 3 kg by a cord passing over a frictionless pulley as shown in fig. The acceleration of each block is- (assume g = 10 m/sec^2)



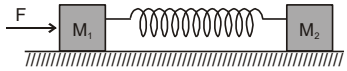
(A) 2 m/sec^2 (B) 4 m/sec^2
(C) 6 m/sec^2 (D) 8 m/sec^2

25. A body, under the action of a force $\vec{F} = 6\hat{i} - 8\hat{j} + 10\hat{k}$, acquires an acceleration of 1 ms^{-2}. The mass of this body must be
(A) $2\sqrt{10}$ kg (B) 10 kg
(C) 20 kg (D) $10\sqrt{2}$ kg

26. The mass of a lift is 500 kg. What will be the tension in its cable when it is going up with an acceleration of 2.0 m/s^{2-}
(A) 5000 N (B) 5600 N
(C) 5900 N (D) 6200 N

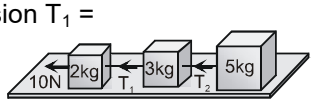
27. A balloon of gross weight w newton is falling vertically downward with a constant acceleration a(<g). The magnitude of the air resistance is :
(A) w (B) $w\left(1+\frac{a}{g}\right)$
(C) $w\left(1-\frac{a}{g}\right)$ (D) $w\frac{a}{g}$

28. Two blocks of masses M_1 and M_2 are connected to each other through a light spring as shown in figure. If we push mass M_1 with force F and cause acceleration a_1 in mass M_1, what will be the magnitude of acceleration in M_2?



(A) F/M_2 (B) $F/(M_1 + M_2)$
(C) a_1 (D) $(F - M_1a_1)/M_2$

29. Three blocks of masses 2 *kg*, 3 *kg* and 5 *kg* are connected to each other with light string and are then placed on a frictionless surface as shown in the figure. The system is pulled by a force F = 10 N, then tension T_1 =



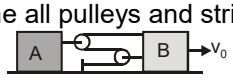
(A) 1*N* (B) 5 *N*
(C) 8 *N* (D) 10 *N*

30. The ratio of the weight of a man in a stationary lift & when it is moving downward with uniform acceleration 'a' is 3 : 2 . The value of 'a' is : (g = acceleration. due to gravity)
(A) (3/2) g (B) g
(C) (2/3) g (D) g/3

31. A body of mass 2 kg is hung on a spring balance mounted vertically in a lift. If the lift descends with an acceleration equal to the acceleration due to gravity 'g' the reading on the spring balance will be-
(A) 2 kg (B) 4g kg
(C) 2g kg (D) zero

32. A block of mass m is placed on a smooth wedge of inclination θ. The whole system is accelerated horizontally so that the block does not slip on the wedge. The force exerted by the wedge on the block has a magnitude.
(A) mg (B) mg/cos θ
(C) mgcos θ (D) mgtan θ

33. Block B is moving towards right with constant velocity v_0. Velocity of block A with respect to block B is-
(Assume all pulleys and strings are ideal)



(A) $v_0/2$ left (B) $v_0/2$ right
(C) $3/2v_0$ right (D) $3/2v_0$ left

34. A stone is dropped from a height h. It hits the ground with a certain momentum P. If the same stone is dropped from a height 100% more than the previous height, the momentum when it hits the ground will change by :
(A) 68% (B) 41%
(C) 200% (D) 100%

35. A person of mass 60 kg is inside a lift of mass 940 kg and presses the button on control panel. The lift starts moving upwards with an acceleration 1.0 m/s^2. If g = 10 ms^{-2}, the tension in the supporting cable is :
(A) 8600 N (B) 9680 N
(C) 11000 N (D) 1200 N

(SECTION-B)

36. A balloon with mass 'm' is descending down with an acceleration 'a' (where a < g). How much mass should be removed from it so that is starts moving up with an acceleration 'a' ?

(A) $\frac{2ma}{g+a}$ (B) $\frac{2ma}{g-a}$

(C) $\frac{ma}{g+a}$ (D) $\frac{ma}{g-a}$

37. A mass of 10 kg is suspended vertically by a rope form the roof. When a horizontal force is applied on the rope at some point, the rope deviated at an angle of 45º at the roof point. If the suspended mass is at equilibrium, the magnitude of the force applied is (g = 10 ms^{-2})
(A) 200 N (B) 100 N
(C) 140 N (D) 70 N

38. A particle of mass m is moving in a straight line with momentum p. Starting at time t = 0, a force F = kt acts in the same direction on the moving particle during time interval T so that its momentum changes from p to 3p. Here k is a constant. The value of T is:

(A) $\sqrt{\frac{2k}{p}}$ (B) $2\sqrt{\frac{k}{p}}$

(C) $2\sqrt{\frac{p}{k}}$ (D) $\sqrt{\frac{2p}{k}}$

39. **Assertion :** On a rainy day, it is difficult to drive a car or bus at high speed.
Reason : The value of coefficient of friction is lowered due to wetting of the surface.
(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.
(B) If both assertion and reason are true but reason is not the correct explanation of the assertion.
(C) If assertion is true but reason is false.
(D) If the assertion and reason both are false.

40. **Assertion :** Linear momentum of a body changes even when it is moving uniformly in a circle.
Reason : Force required to move a body uniformly along a straight line is zero.
(A) If both assertion and reason are true and the reason is the correct explanation of the assertion.
(B) If both assertion and reason are true but reason is not the correct explanation of the assertion.
(C) If assertion is true but reason is false.
(D) If the assertion and reason both are false.

41. A uniform rope of length *l* lies on a table. If the coefficient of friction is μ, then the maximum length l_1 of the part of this rope which can overhang from the edge of the table without sliding down is
(A) $\frac{l}{\mu}$ (B) $\frac{l}{\mu + l}$
(C) $\frac{\mu l}{1+\mu}$ (D) $\frac{\mu l}{\mu - 1}$

42. A heavy uniform chain lies on a horizontal table-top. If the coefficient of friction between the chain and table surface is 0.25, then the maximum fraction of length of the chain, that can hang over one edge of the table is
(A) 20% (B) 25%
(C) 35% (D) 15%

43. Which one of the following statements is correct
(A) Rolling friction is greater than sliding friction
(B) Rolling friction is less than sliding friction
(C) Rolling friction is equal to sliding friction
(D) Rolling friction and sliding friction are same

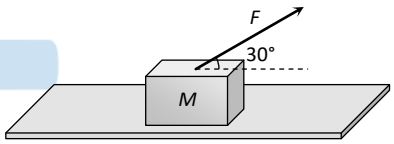
44. The maximum speed that can be achieved without skidding by a car on a circular unbanked road of radius *R* and coefficient of static friction μ, is
(A) μRg (B) $Rg\sqrt{\mu}$
(C) $\mu\sqrt{Rg}$ (D) $\sqrt{\mu Rg}$

45. Consider a car moving along a straight horizontal road with a speed of 72 *km/h*. If the coefficient of kinetic friction between the tyres and the road is 0.5, the shortest distance in which the car can be stopped is $[g = 10\ ms^{-2}]$
(A) 30 *m* (B) 40 *m*
(C) 72 *m* (D) 20 *m*

46. On the horizontal surface of a truck (μ = 0.6), a block of mass 1 *kg* is placed. If the truck is accelerating at the rate of 5*m/sec*^{2} then frictional force on the block will be
(A) 5 *N* (B) 6 *N*
(C) 5.88 *N* (D) 8 *N*

47. When a body is moving on a surface, the force of friction is called
(A) Static friction
(B) Dynamic friction
(C) Limiting friction
(D) Rolling friction

48. A block of mass $M = 5\,kg$ is resting on a rough horizontal surface for which the coefficient of friction is 0.2. When a force $F = 40\ N$ is applied, the acceleration of the block will be $(g = 10\ m/s^2)$



(A) $5.73\ m/\sec^2$ (B) $8.0\ m/\sec^2$
(C) $3.17\ m/\sec^2$ (D) $10.0\ m/\sec^2$

49. When a body is placed on a rough plane inclined at an angle θ to the horizontal, its acceleration is
(A) $g(\sin\theta - \cos\theta)$
(B) $g(\sin\theta - \mu\cos\theta)$
(C) $g(\mu\sin\theta 1 - \cos\theta)$
(D) $g\mu(\sin\theta - \cos\theta)$

50. Match column I with column II and select the correct option from the given codes.

	Column I		**Column II**
P.	Definition of force	(i)	Newton's third law
Q.	Measure of force	(ii)	Impulse
R.	Effect of force	(iii)	Newton's second law
S.	Recoiling of gun	(iv)	Newton's first law

(A) P – (ii), Q – (i), R – (iii), S – (iv)
(B) P – (i), Q – (ii), R – (iii), S – (iv)
(C) P – (iv), Q – (iii), R – (ii), S – (i)
(D) P – (iv), Q – (ii), R – (iii), S – (i)