Q.1 The Newton's laws of motion are valid in-

(1) inertial frames

(2) non-inertial frames

(3) rotating frames

(4) accelerated frames

Q.2 The incorrect statement about Newton's second law of motion is-

(1) it provides a measure of inertia

(2) it provides a measure of force

(3) it relates force and acceleration

(4) it relates momentum and force

Q.3 Newton's third law is equivalent to the-

(1) law of conservation of linear momentum

(2) law of conservation of angular momentum

(3) law of conservation of energy

(4) law of conservation of energy and mass

Q.4 Ratio of intertial mass to gravitational mass is-

(1) 1 : 2   (2) 1 : 1   (3) 2 : 1   (4) No fixed number

Q.5 A man getting down a running bus, falls forward because-

(1) due to inertia of rest, road is left behind and man reaches forward

(2) due to inertia of motion upper part of body continues to be in motion in forward direction while feet come to rest as soon as they touch the road

(3) he leans forward as a matter of habbit

(4) of the combined effect of all the three factors stated in (1), (2) and (3)

Q.6 When we jump out a boat standing in water it moves-

(1) forward   (2) backward   (3) side ways   (4) none of these

Q.7 You are on a friction less horizontal plane. How can you get off if no horizontal force is exerted by pushing against the surface ?

(1) by jumping

(2) by spitting or sneezing

(3) by rolling your body on the surface

(4) by running on the plane

Q.8 Swimming is possible on account of -

(1) first law of motion

(2) second law of motion

(3) third law of motion

(4) Newton's law of gravitation

Q.9 The incorrect relation is-

(1) $F = ma$

(2) $F = m \dfrac{dv}{dt}$

(3) $F = \dfrac{dp}{dt}$

(4) $F = mv$

Q.10 A heavy block of mass m is supported by a cord C from the ceiling, and another cord D is attached to the bottom of the block. If a sudden jerk is given to D, then-
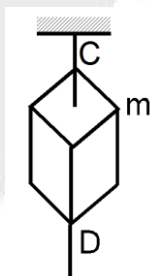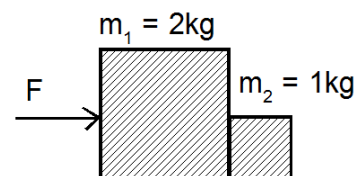

(1) cord C breaks

(2) cord D breaks

(3) cord C and D both break

(4) none of the cords breaks

Q.11 A person says that he measured the acceleration of a particle to be non-zero while no force was acting on the particle-

(1) He is a lier

(2) His clock might have run slow

(3) His meter scale might have been longer than the standard

(4) He might have non-inertial frame

Q.12 When a 1 Newton force acts on a 1 kg body that is able to move freely, the body receives-

(1) A speed of 1 m/sec

(2) An acceleration of 1 m/sec^2

(3) An acceleration of 980 cm/sec^2

(4) An acceleration of 1 cm/sec^2

Q.13 A force of 10 Newton acts on a body of mass 20 kg for 10 seconds. The change produced in momentum is given by-

(1) 5 kg m/sec　　　　　　　　　(2) 100 kg m/sec

(3) 200 kg m/sec　　　　　　　　(4) 2000 kg m/sec

Q.14 A force-time graph for a linear motion is shown in figure where the segments are circular. The linear momentum gained between zero and 8 seconds in -


(1) – 2p N.s　　　　　　　　　　(2) 0 N.s
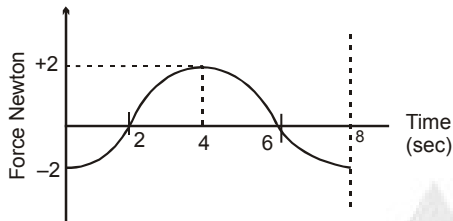
(3) 4p N.s　　　　　　　　　　　(4) – 6 p N.s

Q.15 A particle moves in the xy plane under the action of a force **F** such that the value of its linear momentum (**P**) at any time t is, $P_x = 2 \cos t$, $P_y = 2 \sin t$. The angle q between **P** and **F** at that time t will be -

(1) 0º　　　　　　　　　　　　　(2) 30º

(3) 90º　　　　　　　　　　　　(4) 180º

Q.16 A player catches a ball of 200 g moving with a speed of 20 m/s. If the time taken to complete the catch is 0.5 sec, the force exerted on the players hand is -

(1) 8 N　　　　　　　　　　　　(2) 4 N

(3) 2 N　　　　　　　　　　　　(4) 0 N

Q.17 Blocks are in contact on a frictionless table. A horizontal force F = 3N is applied to one block as shown. The force exerted by the smaller block m_2 on block m_1 is-

(1) 1 N　　　　(2) 2 N　　　　(3) 3 N　　　　(4) 6 N

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Q.18 Three block are connected as shown, on a horizontal frictionless table and pulled to the right with a force $T_3 = 60$ N. If $m_1 = 10$ kg, $m_2 = 20$ kg and $m_3 = 30$ kg, the tension T_2 is-

(1) 10 N

(2) 20 N

(3) 30 N

(4) 60 N

Q.19 Two masses are hanging vertically over frictionless pulley. The acceleration of the two masses is-

(1) $\dfrac{m_1}{m_2} g$

(2) $\dfrac{m_2}{m_1} g$

(3) $\left(\dfrac{m_2 - m_1}{m_1 + m_2} \right) g$

(4) $\left(\dfrac{m_1 + m_2}{m_2 - m_1} \right) g$

Q.20 Two bodies of 5 kg and 4 kg are tied to a string as shown in the figure. If the table and pulley both are smooth, acceleration of 5 kg body will be equal to-

(1) g

(2) g/9

(3) 4g/9

(4) 5g/9

Q.21 Three equal weights A, B, C of mass 2 kg each are hanging on a string passing over a fixed frictionless pulley as shown in the fig. The tension in the string connecting weights B and C is-

(1) zero

(2) 13 Newton

(3) 3.3 Newton

(4) 19.6 Newton

Q.22 Two bodies of mass 0.3 kg and 0.4 kg are tied to the ends of a weightless string which passes over a smooth pulley as shown in the figure. The tension in the string is-
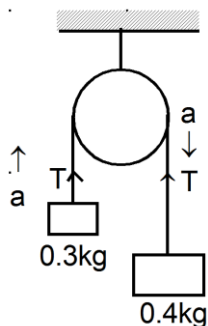

(1) 3.06 Newton   (2) 3.36 Newton   (3) 4.05 Newton   (4) 3.0 Newton

Q.23 A block of mass m_1 = 2 kg on a smooth inclined plane at angle 30º is connected to a second block of mass m_2 = 3 kg by a cord passing over a frictionless pulley as shown in figure. The acceleration of each block is-

(Assume g = 10 m/sec²)
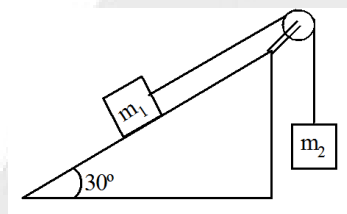
(1) 2 m/sec²   (2) 4 m/sec²   (3) 6 m/sec²   (4) 8 m/sec²

Q.24 A body floats in liquid contained in a beaker. If the whole system as shown in figure falls under gravity then the upthrust on the body is-
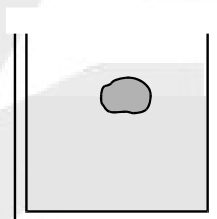
(1) 2 mg   (2) zero   (3) mg   (4) less than mg

Q.25 Two blocks are connected by a cord passing over a small frictionless pulley and resting on frictionless planes as shown in the figure The accleration of the blocks is-
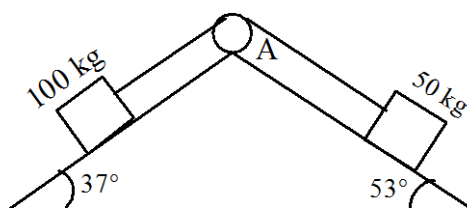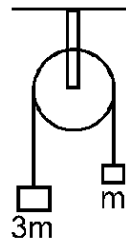

(1) 0.33 m/s²   (2) 0.66 m/s²   (3) 1 m/s²   (4) 1.32 m/s²

Q.26 A thief stole a box full of valuable articles of weight W and while carrying it on his back, he jumped down a wall of height h from the ground. Before he reached the ground, he experienced a load of

(1) 2W   (2) W   (3) W/2   (4) zero

**Q.27** In given figure find out the acceleration of any of the particle-

(1) $(1/2)g$ (2) g   (3) $(1/3)\,g$ (4) $(1/4)\,g$

Q.28 In the figure a smooth pulley of negligible weight is suspended by a spring balance. Weights of 1kg and 5 kg are attached to the opposite ends of a string passing over the pulley and move with acceleration because of gravity. During the motion, the spring balance reads a weight of -
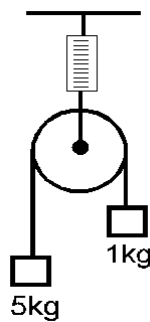

(1) 6 kg   (2) less than 6 kg

(3) more than 6 kg   (4) may be more or less than 6 kg

Q.29 A block D weighing 300 kg is suspended by means of two cords A and B as shown in the figure. W is a vertical wall and R a horizontal rigid beam. The tension in the string A in kg is-
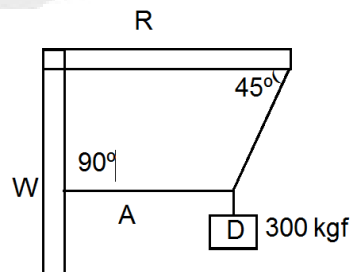
(1) zero   (2) 150   (3) 300   (4) 400

Q.30 Two weights of 15 kg each are attached by means of two strings to the two ends of a spring balance, as shown in the diagram. The pulleys are frictionless. The reading of the balance would be-

15kg   15kg
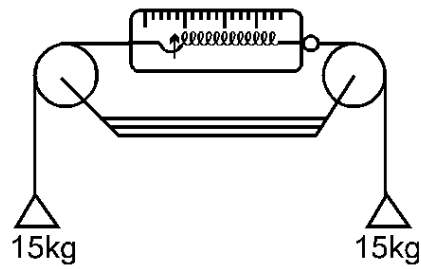
(1) zero   (2) 15 kg   (3) 30 kg   (4) 75 kg

ANSWER KEY

Que.	1	2	3	4	5	6	7	8	9	10
Ans.	1	1	1	2	2	2	2	3	4	2
Que.	11	12	13	14	15	16	17	18	19	20
Ans.	4	2	2	2	3	1	1	3	3	4
Que.	21	22	23	24	25	26	27	28	29	30
Ans.	2	2	2	2	4	4	1	2	3	2