

PYQSide

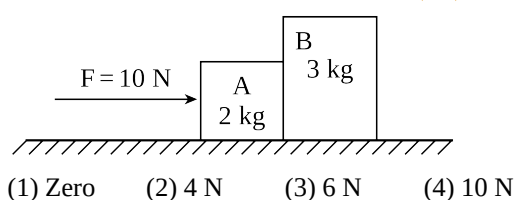
NEET LAWS OF MOTION — FREE BODY DIAGRAMS, CONNECTED BODIES, PULLEYS, LIFTS AND WEDGES — PYQS

Max. Marks: 60

Questions: 15

Section A (MCQ)

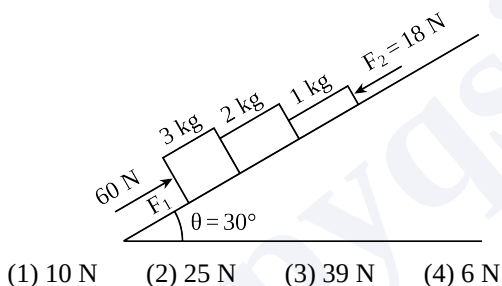
- Q.1** A horizontal force 10 N is applied to a block A as shown in figure. The mass of blocks A and B are 2 kg and 3 kg respectively. The blocks slide over a frictionless surface. The force exerted by block A on block B is : [NEET (UG) 2024]



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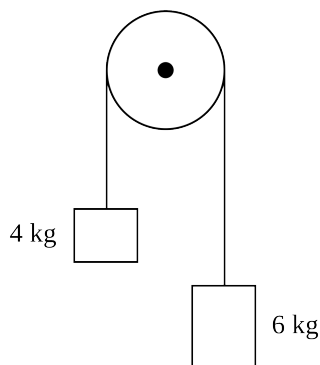
- Q.2** In the diagram shown, the normal reaction force between 2 kg and 1 kg is (Consider the surface, to be smooth) : (Given $g = 10 \text{ m s}^{-2}$) [NEET (UG) 2022 (Phase 2)]



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- Q.3** Two bodies of mass 4 kg and 6 kg are tied to the ends of a massless string. The string passes over a pulley which is frictionless (see figure). The acceleration of the system in terms of acceleration due to gravity (g) is : [NEET (UG) 2020]

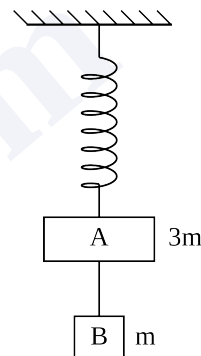


- (1) $g/2$ (2) $g/5$ (3) $g/10$ (4) g

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- Q.4** Two blocks A and B of masses $3m$ and m respectively are connected by a massless and inextensible string. The whole system is suspended by a massless spring as shown in figure. The magnitudes of acceleration of A and B immediately after the string is cut, are respectively [NEET 2017]



- (1) $\frac{g}{3}, g$ (2) g, g (3) $\frac{g}{3}, \frac{g}{3}$ (4) $g, \frac{g}{3}$

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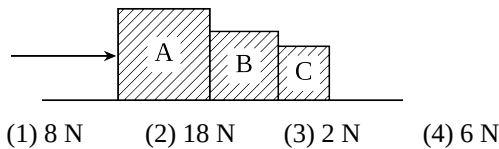
- Q.5** A block A of mass m_1 rests on a horizontal table. A light string connected to it passes over a frictionless pulley at the edge of table and from its other end another block B of mass m_2 is suspended. The coefficient of kinetic friction between the block and the table is μ_k . When the block A is sliding on the table, the tension in the string is [AIPMT 2015 (Cancelled)]

- (1) $\frac{m_1 m_2 (1 + \mu_k) g}{(m_1 + m_2)}$ (2) $\frac{m_1 m_2 (1 - \mu_k) g}{(m_1 + m_2)}$
 (3) $\frac{(m_2 + \mu_k m_1) g}{(m_1 + m_2)}$ (4) $\frac{(m_2 - \mu_k m_1) g}{(m_1 + m_2)}$

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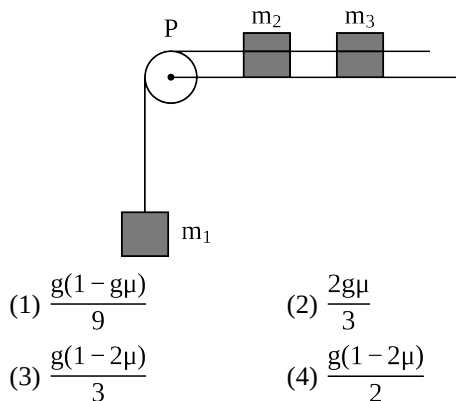
- Q.6** Three blocks A, B and C, of masses 4 kg, 2 kg and 1 kg respectively, are in contact on a frictionless surface, as shown. If a force of 14 N is applied on the 4 kg block, then the contact force between A and B is [AIPMT 2015 (Cancelled)]



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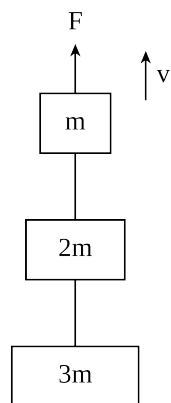
- Q.7** A system consists of three masses m_1 , m_2 and m_3 connected by a string passing over a pulley P. The mass m_1 hangs freely and m_2 and m_3 are on a rough horizontal table (the coefficient of friction $= \mu$). The pulley is frictionless and of negligible mass. The downward acceleration of mass m_1 is (Assume $m_1 = m_2 = m_3 = m$) [AIPMT 2014]



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- Q.8** Three blocks with masses m , $2m$ and $3m$ are connected by strings, as shown in the figure. After an upward force F is applied on block m , the masses move upwards at constant speed v . What is the net force on the block of mass $2m$? (g is the acceleration due to gravity) [NEET 2013]



- (1) $3mg$ (2) $6mg$ (3) zero (4) $2mg$

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- Q.9** 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 $g = 10 \text{ m/s}^2$, the tension in the supporting cable is [AIPMT 2011 (Prelims)]

- (1) 8600 N (2) 9680 N (3) 11000 N (4) 1200 N

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- Q.10** The mass of a lift is 2000 kg. When the tension in the supporting cable is 28000 N, then its acceleration is: [AIPMT 2009]

- (1) 4 m/s^2 upwards (2) 4 m/s^2 downwards
 (3) 14 m/s^2 upwards (4) 30 m/s^2 downwards

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- Q.11** 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 will be (g is acceleration due to gravity) [AIPMT 2004]

- (1) $mg \cos \theta$ (2) $mg \sin \theta$
 (3) mg (4) $mg / \cos \theta$

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- Q.12** 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? ($g = 10 \text{ m/s}^2$) [AIPMT 2003]

- (1) zero (2) 400 N (3) 800 N (4) 1200 N

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- Q.13** 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? ($g = 10 \text{ m/s}^2$) [AIPMT 2003]

- (1) 5 m/s^2 (2) 10 m/s^2 (3) 25 m/s^2 (4) 2.5 m/s^2

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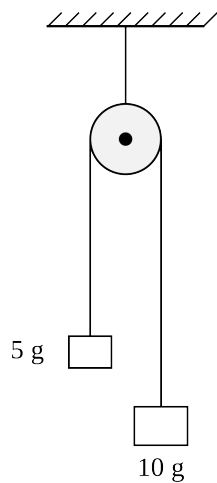
- Q.14** A lift of mass 1000 kg which is moving with acceleration of 1 m/s^2 in upward direction, then the tension developed in string which is connected to lift is [AIPMT 2002]

- (1) 9800 N (2) 10,800 N
 (3) 11,000 N (4) 10,000 N

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- Q.15** Two masses as shown in the figure are suspended from a massless pulley. The acceleration of the system when masses are left free is [AIPMT 2000]



- (1) $\frac{2g}{3}$ (2) $\frac{g}{3}$ (3) $\frac{g}{9}$ (4) $\frac{g}{7}$

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full solution



ANSWER KEY

Ques.	1	2	3	4	5	6	7	8	9	10	11
Ans.	3	2	2	1	1	4	3	3	3	1	4
Ques.	12	13	14	15							
Ans.	4	4	2	2							