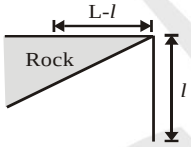
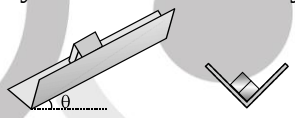
PHYSICS

1. Uniform rope of length L is released from rest from the situation shown in figure. Time taken by the rope before leaving the rock is, (Given l = L/2)



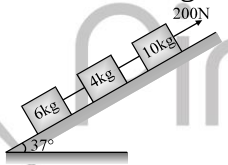
(a) $\sqrt{\frac{L}{g}}$ (b) $\sqrt{\frac{L}{g}}\ln(2+\sqrt{2})$ (c) $\sqrt{\frac{L}{g}}\ln(2+\sqrt{3})$ (d) $\sqrt{\frac{L}{g}}\ln(2-\sqrt{2})$

2. Normal reaction on the block by each of the mutually perpendicular inclined planes are



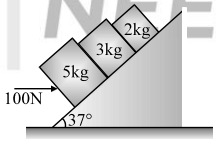
(a) $\frac{Mg}{\sqrt{2}}$ (b) $\frac{Mg\cos\theta}{\sqrt{2}}$ (c) $\frac{Mg\sin\theta}{\sqrt{2}}$ (d) Mg cos θ

3. Tension in the string connected between 4 kg and 6 kg block is



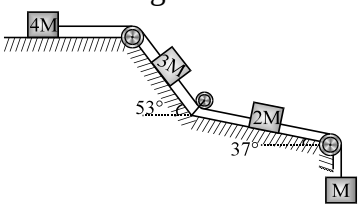
(a) 100 N (b) 108 N (c) 114 N (d) 60 N

4. Ratio of normal reaction between the blocks 5 kg, 3 kg and 3 kg and 2 kg is



(a) 3 : 2 (b) 5 : 2 (c) 2 : 1 (d) 7 : 4

5. Tension in the string connected between blocks of masses 3 M and 2 M is



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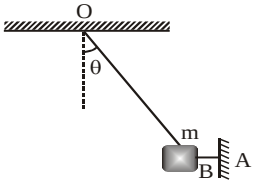
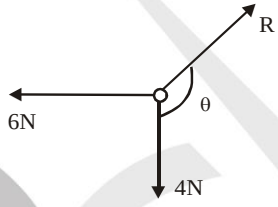
(a) $\frac{101}{50}Mg$ (b) $\frac{113}{50}Mg$ (c) $\frac{41}{50}Mg$ (d) $\frac{173}{50}Mg$

6. If string between A and B is cut, then just after cutting the string



(a) Acceleration of the block is g downwards and tension in the string is zero.
(b) Acceleration of the block is g sin θ and tension in the string is mg cos θ.
(c) Acceleration of the block is g cos θ and tension in the string is mg sin θ.
(d) Acceleration of the block is g sin θ downwards and tension in the string is zero

7. Acceleration of the particle of mass 2 kg shown in figure is 1 m/s^2 then (R, θ) is

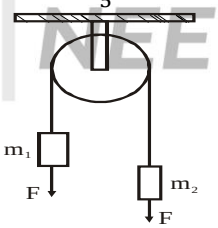


(a) $(5N, 143^0)$ (b) $(4N, 90^0)$
(c) $\left(4\sqrt{2}N, 135^0\right)$ (d) $(10N, 127^0)$

8. Name of the animal shown in the diagram is KAWAR BIJJU and its average mass is 8 kg. If breaking strength of the rope is 100 N, then which of the following accelerations is not achievable for a normal KAWAR BIJJU with the help of this rope

(a) 2.5 m/s^2 downwards (b) 12.5 m/s^2 downwards
(c) 2.5 m/s^2 upwards (d) 1.25 m/s^2 upwards

9. If acceleration of block of mass m_1 is $\frac{g}{5}$ upwards, then ratio of masses of the block m_1 and m_2 is



(a) 1 : 5 (b) 2 : 3 (c) 1 : 4 (d) Insufficient data

10. If ratio of tension in string with pulling force F is 3 : 1, then ratio of m_1 and m_2 is

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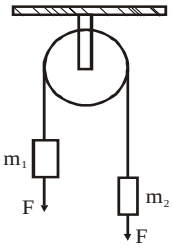
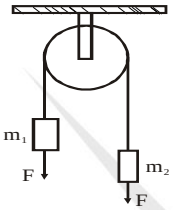


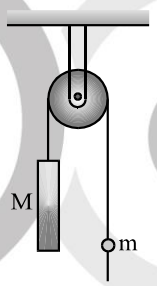
(a) 1 : 2 (b) 2 : 1 (c) 4 : 1 (d) All of these

11. Initially tension in the string is $2m_1g$. If downward force F is removed from the block of mass m_2 then acceleration of m_2 will be



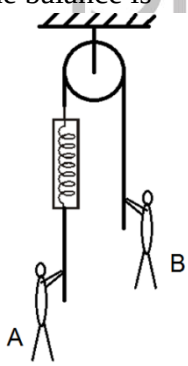
(a) $\frac{2\,m_1 g}{m_1+m_2}$ (b) $\frac{3\,{m_1}^2-m_2^2}{(m_1+m_2)^2}g$ (c) $\frac{{m_1}^2+m_2^2}{(m_1+m_2)^2}g$ (d) $\frac{2\,{m_1}^2-m_2^2}{(m_1+m_2)^2}g$

12. Vertical length of the block of mass M is 1 meter. Blocks are released from rest and time elapsed before crossing the blocks each other is 1 sec., then ratio of M and m will be



(a) 2 : 1 (b) 5 : 7 (c) 4 : 3 (d) 11 : 9

13. Mass of man *A* is 80 kg and that of *B* is 40 kg. If acceleration of *A* relative *B* is 6 m/s^2 downwards, then reading of the balance is



(a) 60 kg (b) 48 kg (c) 72 kg (d) 96 kg

14. Mass of man *A* is 60 kg and that of *B* is 40 kg. If man A pulls the rope with acceleration 2 m/s^2 and man B pulls the rope with acceleration 3 m/s^2, then acceleration of man A with respect to ground is

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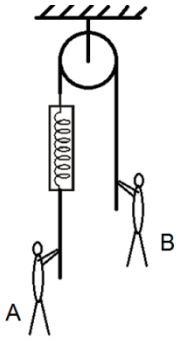
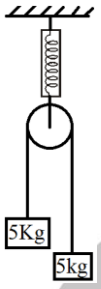
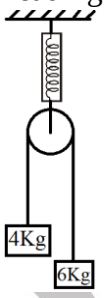


(a) zero
(b) 0.1 m/s^2 upwards
(c) 0.2 m/s^2 downwards
(d) 0.3 m/s^2 downwards

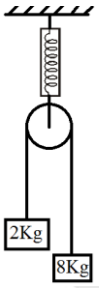
15. In which of the following reading of spring balance is maximum



(a)



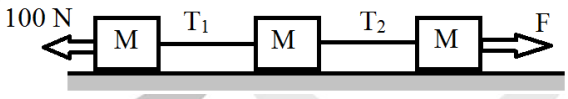
(b)



(c)

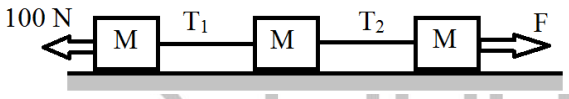
(d) In each case spring balance will read same weight

16. If ratio of tensions T_1 & T_2 is 5 : 3, then F is



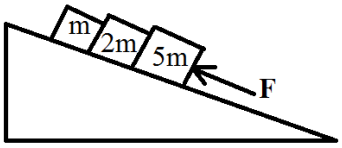
(a) $\frac{100}{7}N$
(b) $\frac{200}{7}N$
(c) $\frac{900}{7}N$
(d) $\frac{800}{7}N$

17. If ratio of tensions T_1 & T_2 is 3 : 5, then F is



(a) 300 N
(b) 700 N
(c) 280 N
(d) 990 N

18. Ratio of normal reaction between m, 2m and 2m, 5m is



(a) 1 : 5
(b) 2 : 5
(c) 1 : 2
(d) 1 : 3

19. Acceleration of each block along the plane is (angle of inclination is 30^o)

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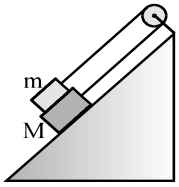
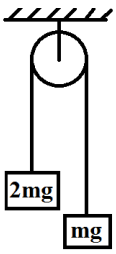
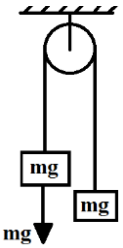


(a) $\frac{M-m}{M+m}g$ (b) $\frac{M-m}{2(M+m)}g$ (c) $\frac{\sqrt{3}(M-m)}{2(M+m)}g$ (d) $\frac{M-m}{\sqrt{3}(M+m)}g$

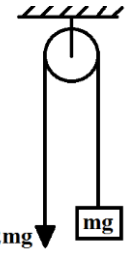
20. Decreasing order of acceleration of blocks



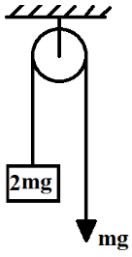
(i)



(ii)



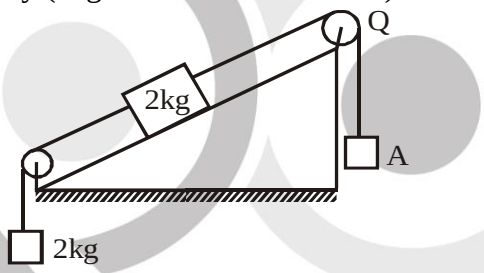
iii)



(iv)

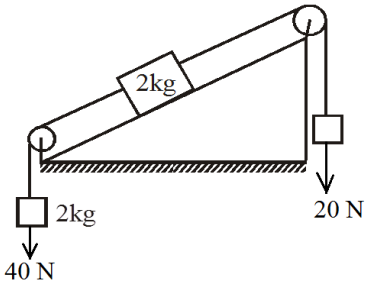
(a) (i) > (ii) = (iii) > (iv) (b) (iii) > (ii) = (iv) > (i)
(c) (iii) > (ii) > (iv) = (i) (d) (iii) > (i) = (ii) > (iv)

21. Acceleration of the block on the inclined plane is 4 m/s^2 downwards to the plane, then mass of block A is approximately (angle of inclination is 30^o)



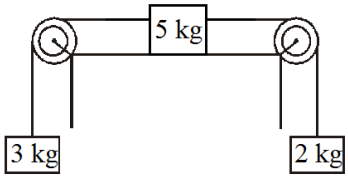
(a) 1.0 kg (b) 3.3 kg (c) 5.1 kg (d) 6.6 kg

22. If acceleration of the block which is pulled by 40 N force is 5 m/s^2 upwards, then what will be acceleration of same block if pulling force of 20 N is removed (angle of inclination is 30^o)



(a) 3.6 m/s^2 (b) 7.2 m/s^2 (c) 8.4 m/s^2 (d) 9 m/s^2

23. Acceleration of the block on the table is



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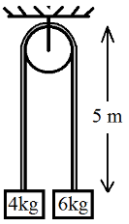
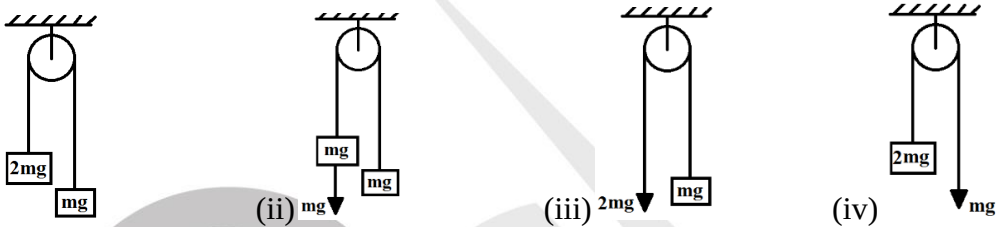
(a) 1 m/s^2 (b) 3/7 m/s^2 (c) 3/8 m/s^2 (d) 2/5 m/s^2

24. Mass of the uniform rope is 5 kg and length of the rope is 10 m. System is released from rest as shown in figure. Tension in the string at 2m above the 4 kg block at this instant is.



(a) 53.33 N (b) 56.67 N (c) 63.33 N (d) 66.67 N

25. Decreasing order of tension in strings is

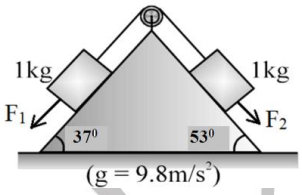


(i) (ii) (iii) (iv)

(a) (i) > (ii) > (iii) > (iv) (b) (iii) > (ii) > (i) > (iv)

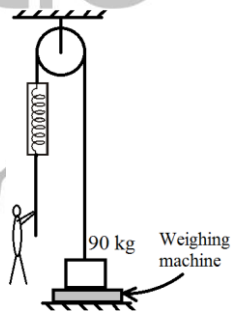
(c) (iii) > (ii) > (iv) > (i) (d) (ii) > (iii) > (iv) > (i)

26. If tension in the string, connected between blocks, is 10 N then sum of magnitudes of pulling forces F_1 and F_2 is



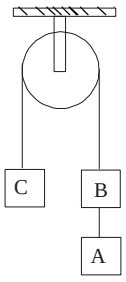
(a) 4 N (b) 6 N (c) 8 N (d) None

27. Man pulls the rope with a constant acceleration 1 m/s^2 and reading of weighing machine is 24 kg. If man starts pulling rope with constant acceleration 2 m/s^2, then acceleration of block will be



(a) 0.4 m/s^2 (b) 0.8 m/s^2 (c) 1.2 m/s^2 (d) zero

28. Each block shown in the figure has same mass. Acceleration of block A is



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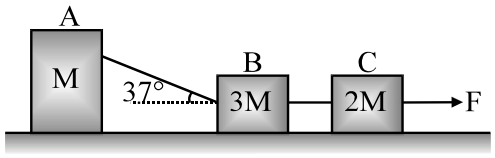
(a) g/2 (b) g/3 (c) g/4 (d) g/5

29. Complete system has constant acceleration in horizontal direction. Tension in the string collected between blocks A and B



(a) $\frac{5F}{18}$ (b) $\frac{4F}{18}$ (c) $\frac{3F}{20}$ (d) $\frac{5F}{24}$

30. If force between 3rd and 4th link of the chain is 20 N, then F will be

(a) 40 N (b) 50 N (c) 48 N (d) Data is insufficient

Answer Key :

1	2	3	4	5	6	7	8	9	10
C	B	D	B	C	B	C	B	B	D
11	**12**	**13**	**14**	**15**	**16**	**17**	**18**	**19**	**20**
B	D	B	A	A	A	B	D	B	B
21	**22**	**23**	**24**	**25**	**26**	**27**	**28**	**29**	**30**
A	A	A	B	B	B	D	B	D	B

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