WEEKLY TEST TYM-01 SOLUTION 17 AUGUST 2019

PHYSICS

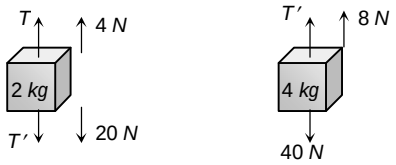
1. (d) Application of Bernoulli's theorem.

2. (c)

3. (b) $F = \sqrt{(F)^2 + (F)^2 + 2F.F\cos\theta} \Rightarrow \theta = 120°$

4. (d) Range of resultant of F_1 and F_2 varies between $(3+5)=8N$ and $(5-3)=2N$. It means for some value of angle (θ), resultant 6 can be obtained. So, the resultant of 3*N*, 5*N* and 6*N* may be zero and the forces may be in equilibrium

5. (a) FBD of mass 2 *kg* FBD of mass 4*kg*



$T - T' - 20 = 4$ ....(i) $T' - 40 = 8$ ...(ii)

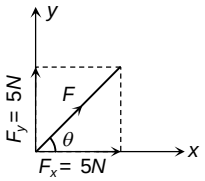
By solving (i) and (ii) $T' = 47.23\ N$ and $T = 70.8\ N$

6. (a)

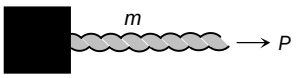
7. (b) $|\vec{F}| = \sqrt{5^2 + 5^2} = 5\sqrt{2}\ N.$

and $\tan\theta = \frac{5}{5} = 1$

$\Rightarrow \theta = \pi/4.$



8. (c)



Acceleration of the system $= \frac{P}{m+M}$

The force exerted by rope on the mass $= \frac{MP}{m+M}$

9. (c) Acceleration $= \frac{(m_2 - m_1)}{(m_2 + m_1)}g$

$= \frac{4-3}{4+3} \times 9.8 = \frac{9.8}{7} = 1.4\, m/\sec^2$

10. (a) Acceleration $= \frac{m_2}{m_1 + m_2} \times g = \frac{1}{2+1} \times 9.8 = 3.27\ m/s^2$

and $T = m_1 a = 2 \times 3.27 = 6.54\ N$

11. (d) $T = \frac{2m_1 m_2}{m_1 + m_2} g = \frac{2 \times 10 \times 6}{10 + 6} \times 9.8 = 73.5 N$

12. (b) $a = \frac{m_2}{m_1 + m_2} g = \frac{3}{7+3} 10 = 3\, m/s^2$

13. (c) $T_1 = \left(\frac{m_2 + m_3}{m_1 + m_2 + m_3} \right) g = \frac{3+5}{2+3+5} \times 10 = 8N$

14. (c) $T \sin 30 = 2 kg\ wt$

$\Rightarrow T = 4\ kg\ wt$

$T_1 = T \cos 30^\circ$

$= 4 \cos 30^\circ$

$= 2\sqrt{3}$

15. (b) $a = \left(\frac{m_1 - m_2}{m_1 + m_2} \right) g \Rightarrow \frac{g}{8} = \left(\frac{m_1 - m_2}{m_1 + m_2} \right) g \Rightarrow \frac{m_1}{m_2} = \frac{9}{7}$