WORK - ENERGY REVIEW

1.) **D**

$$P = \frac{F\Delta x}{t} = \frac{490_N(5_m)}{20_s}$$

$$P = 122.5_W$$

$F_{LIFT} = 490_N$

490_N

2.) **C**

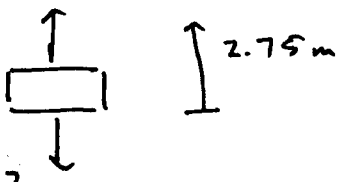
$$P = \frac{F\Delta x}{t}$$

$$t = \frac{F\Delta x}{P}$$

$$t = \frac{2070(2.75)}{1440}$$

$$t = 3.9_s.$$

$F_{LIFT} = 2070_N$



2070_N

3.) **D**

$K = \frac{1}{2}mv^2$ ← IF V IS DOUBLED, IC GOES UP BY 4 BECAUSE OF V^2

4.) **A**

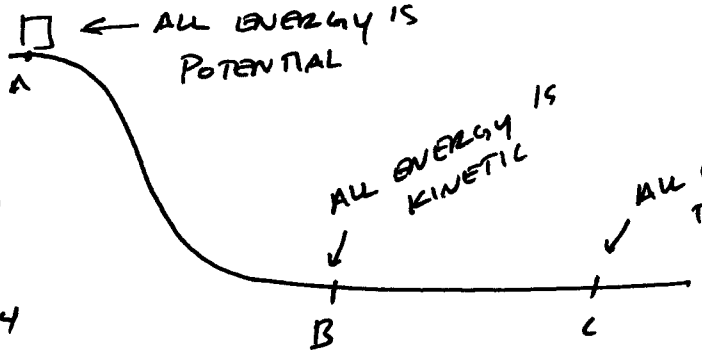
THE KINETIC ENERGY OF THE BLOCK BECOMES SPRING POTENTIAL.

$$K = U_s$$

$$\tfrac{1}{2}mv^2 = \tfrac{1}{2}kx^2$$

$$v = \sqrt{\frac{kx^2}{m}} = \sqrt{\frac{500(.05)^2}{2.5}} = 0.71_{m/s}$$

5.) **B**



$mgh = \mu F_N d$

$mgh = \mu mgd$

$\frac{h}{d} = \mu = 0.4$

$E_A = E_c$

$U_g = W_{FRICTION}$

$mgh = fd$

6. [A] KINETIC ENERGY DEPENDS ON MASS & VELOCITY

$K = \frac{1}{2}mv^2$

- NEITHER IS DIFFERENT

7. [B] POTENTIAL @ TOP = KINETIC @ BOTTOM

$mgh = \frac{1}{2}mv^2$

$\sqrt{2gh} = v$

$\sqrt{2(10)(1)} = v$

$4.47\ m/s = v$

8. [C] E 1 → 2W E 2 → 1W

$W = P(t)$

$2(1)(2h) = 2t$

$W = P(2\ \text{HOURS})$

$W = 1W(2\ \text{HOURS})$

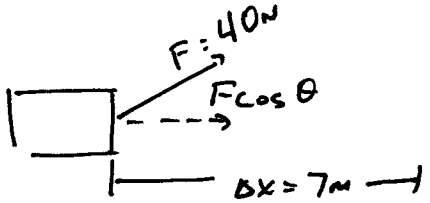
$2h = t$

9. [D] $W_{NET} = 0 = \Delta K$

IF THE VELOCITY IS CONSTANT, ZERO NET WORK IS DONE

10. [E] WATT IS FOR POWER NOT WORK

11. [A]



$W = 247\ J$

$W = F\cos\theta\,\Delta x$

$247 = 40\cos\theta\,(7)$

$\frac{247}{40 \cdot 7} = \cos\theta$, $\theta = 28°$

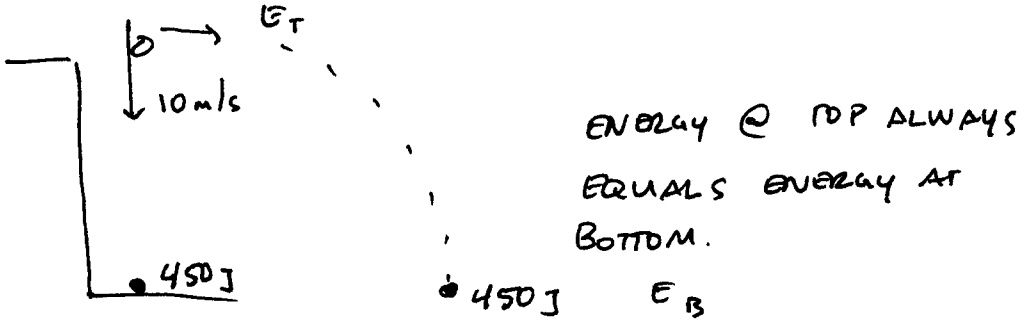
13. [C] $K = \frac{1}{2}mv^2$

- ANY MOVING OBJECT HAS ZERO KINETIC ENERGY

14. [C] $K = \frac{1}{2}mv^2$ — IF V INCREASES, SO DOES THE K.

15. [E] CONSTANT VELOCITY = 0 NET WORK

16. [C]



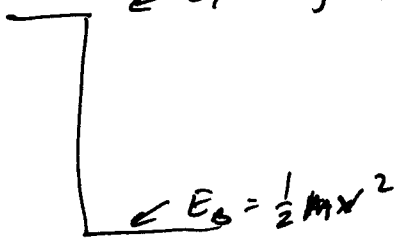
ENERGY @ TOP ALWAYS EQUALS ENERGY AT BOTTOM.

17. [D]

- THE BALL GOES UP [INCREASE IN U_g]
& SLOWS DOWN [DECREASE IN K]

18. [D] - DEFINITION

19. [E]



$E_T = E_B$

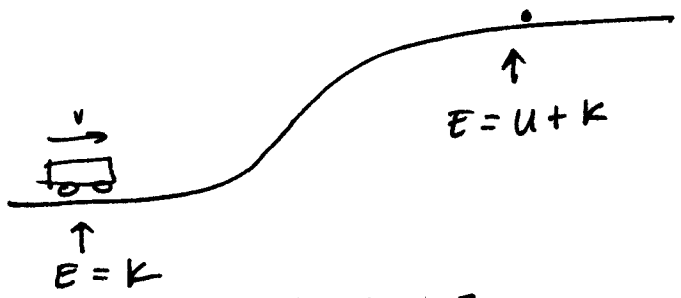
$mgh = \frac{1}{2}mv^2$

$h = \frac{v^2}{2g}$

$h = \frac{17^2}{2(10)}$

$h = 14.5\,m$

20. D



$\frac{1}{2}m(20)^2 = mg(15) + \frac{1}{2}mv^2$

$200 = 150 + \frac{1}{2}v^2$

$50 = \frac{1}{2}v^2$

$100 = v^2$

$10 = v$

21. D

$E_T = E_B$

$\frac{1}{2}m(5)^2 + mgh = \frac{1}{2}m(13)^2$

$12.5 + 10(h) = 84.5$

$10(h) = 72$

$h = 7.2\text{ m}$