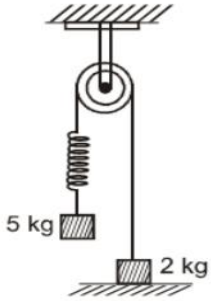
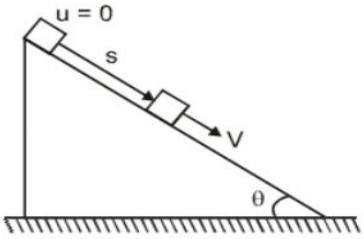
WORK POWER ENERGY

System shown in figure is released from rest. Pulley and spring is massless and friction is absent everywhere. The speed of 5 kg block when 2 kg block leaves contact with ground is : (Take force constant of spring k = 40 N/m and g = 10 m/s²)



(A) $\sqrt{2}$ m/s (B) $2\sqrt{2}$ m/s (C) 2 m/s (D) $4\sqrt{2}$ m/s

A block is released from the top of a smooth inclined plane of inclination θ as shown in figure. Let *v* be the speed of the particle after travelling a distance s down the plane. Then which of the following will remain constant?



(A) $v^2 + 2gs \sin\theta$ (B) $v^2 - 2gs \sin\theta$ (C) $v - \sqrt{2gs}\sin\theta$ (D) $v + \sqrt{2gs}\sin\theta$

A pump is required to lift 800 kg of water per minute from a 10 m deep well and eject it with a speed of 20 m/s. The required power in watts of the pump will be :
(A) 240000 (B) 4000 (C) 5000 (D) none of these

An engine pumps up 1000 kg of coal from a mine 100 m deep in 0.5 sec. The pump is running with diesel and efficiency of diesel engine is 25%. Then its power consumption will be (g = 10m/sec²):
(A) 200 kW (B) 8000 kW (C) 1000 kW (D) 500 kW

A particle is projected with a velocity u making an angle θ with the horizontal. The instantaneous power of the gravitational force
(A) varies linearly with time (B) is constant throughout
(C) is negative for complete path (D) None of the above

ANSWER KEY

1.(B) 2.(B) 3.(B) 4.(B) 5.(A)