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**General Physics-I, Quiz 3**  
PHYS1000AA, Fall Semester-108  
2019-12-12

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St. ID: \_\_\_\_\_,

Name: \_\_\_\_\_

1. On October 21, 2001, Ian Ashpole of the United Kingdom achieved a record altitude of 3.35 km (11 000 ft) powered by 600 toy balloons filled with helium. Each filled balloon had a radius of about 0.50 m and an estimated mass of 0.30 kg. (a) Estimate the total buoyant force on the 600 balloons. (b) Estimate the net upward force on all 600 balloons. (c) Ashpole parachuted to the Earth after the balloons began to burst at the high altitude and the buoyant force decreased. Why did the balloons burst?

2. A 2.00-kg object attached to a spring moves without friction ( $b=0$ ) and is driven by an external force given by the expression  $F = 3.00 \sin(2\pi t)$ , where  $F$  is in newtons and  $t$  is in seconds. The force constant of the spring is 20.0 N/m. Find (a) the resonance angular frequency of the system, (b) the angular frequency of the driven system, and (c) the amplitude of the motion.