

PHYS 102
Sample Midterm Exam Questions

1. Kuala Lumpur's Petronas Towers hold the title as the tallest buildings in the world. Each tower has a height of 452 meters. If there were no air resistance, how long would it take an object to fall from this height?
 - (a) 9.6 seconds
 - (b) 10.6 seconds
 - (c) 11.6 seconds
 - (d) 12.6 seconds
 - (e) 13.6 seconds

2. What experiment did we do in class involving a bowling ball and a metal cable?
 - (a) I spun the bowling ball in a circle, faster and faster, until the cable tension was so great that the cable broke.
 - (b) I dropped the bowling ball onto a small pile of gunpowder, to show the gravitational potential energy was enough to ignite the gunpowder.
 - (c) The bowling ball was suspended from the ceiling and set into motion, narrowly missing someone's face.
 - (d) We looked at the reflected light from the bowling ball through a diffraction grating.

3. The "e" in laser stands for
 - (a) Einstein
 - (b) elapsed
 - (c) emission
 - (d) electric field
 - (e) electron

4. During spontaneous emission from an atom, which of the following occur?
- I. the electron leaves the atom in the same direction as the incoming electron
 - II. the photon leaves the atom in the same direction as the incoming photon
 - III. the photon leaves the atom in a random direction
 - IV. the photon leaving the atom has energy determined by the initial and final orbits of the electron in the atom

- (a) I only
- (b) II only
- (c) II and IV only
- (d) III and IV only
- (e) I and IV only

5. Your friend's 2000-kg car won't start, so you decide to push-start it (it has a manual transmission). Starting from rest, you push it on level ground until it has a speed of 5 meters per second. If all of the energy from the food you burned is turned into energy of motion of the car, about how many food calories did you consume in this endeavor?

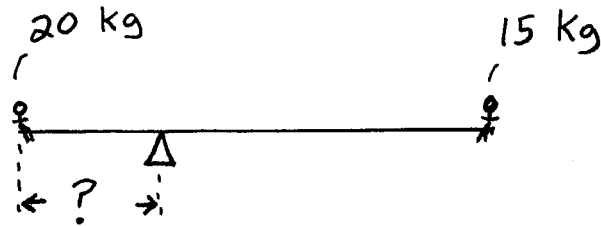
- (a) 2
- (b) 6
- (c) 15
- (d) 21
- (e) 45

6. A 60-kg person climbs some stairs, rising vertically through a distance of 10 meters in 14.7 seconds. What is this person's average power output during that exercise?

- (a) 41 Watts
- (b) 250 Watts
- (c) 400 Watts
- (d) 441 Watts
- (e) 882 Watts

7. A seesaw has mass 40 kg and length 3 meters. Two children sit on the very ends as shown. How far from the left must the fulcrum be located in order for the seesaw to balance?

- (a) 1.0 m
- (b) 1.3 m
- (c) 1.4 m
- (d) 1.6 m
- (e) 1.7 m



Answers:

- 1. A
- 2. C
- 3. C
- 4. D
- 5. B
- 6. C
- 7. C