

## 2010 Final Exam answers

1. The three principles
2. E
3. C
4. B
5. A
6. E
7. A
8. A
9. E
10. C
11. A
12. B
13. A
14. D
15. C
16.
  - a. 12 m/s
  - b. 1142.5 J

“3”

- c.  $v + \frac{m}{M}(v_1 + v_2)$
  - d.  $\omega_i + \frac{2m(d+R)}{MR^2}(v_1 + v_2)$
- 17.

- a.  $\sqrt{\frac{2Fd}{(M + 2m)}}$
- b.  $\sqrt{\frac{2Fl}{(\frac{1}{2}MR^2 + 2mb^2)}}$

“20”

- a. Some becomes thermal/internal energy during collision
- b. System = ball+beam; Principles = Angular Momentum  $\omega_i + \frac{\frac{1}{2}2mv}{\frac{1}{12}Ml^2 + \frac{1}{4}ml^2}$
- c. 0.05