

Journal: Chapter 10b – Impact of Masses, Conservation of Momentum

Sections 10-7

1. In considering the impact of two masses, what are the first three decisions or observations you must make before you can categorize the impact event and then analyze the event?

2. What is required for an impact of two masses to be called a central impact? _____

3. What is required for an impact of two masses to be called a direct impact? _____

4. What is required for an impact of two masses to be called an eccentric impact? _____

5. What is required for an impact of two masses to be called an oblique impact? _____

6. What condition on the masses defines a perfectly plastic impact? _____

7. What condition on the masses defines a perfectly elastic impact? _____

8. What value does the coefficient of restitution take in each of the above limiting cases for impact? For Plastic $e =$ _____ For Elastic $e =$ _____

9. What condition must exist for conservation of linear momentum to be valid for two impacting masses in the direction of the LOI? _____

10. In terms of the restoring impulse and the deforming impulse, how is “coefficient of restitution” defined? _____

11. In the equation below for direct central impact, what is the requirement on the signs and orientations of the velocity terms?

$$e = \frac{[(v_B)_2 - (v_A)_2]}{[(v_A)_1 - (v_B)_1]}$$

12. In the equation below for oblique central impact, what is the additional requirement on the velocity terms beyond the previous version of the equation?

$$e = \frac{[(\mathbf{v}_{BN})_2 - (\mathbf{v}_{AN})_2]}{[(\mathbf{v}_{AN})_1 - (\mathbf{v}_{BN})_1]}$$

13. In the above case and in the absence of friction between the masses, what can be said about the tangential components of the velocity of each mass? _____

14. In the equation below for eccentric impact, what is the additional requirement on the velocity terms beyond the previous version of the equation?

$$e = \frac{[(\mathbf{v}_{eBN})_2 - (\mathbf{v}_{eAN})_2]}{[(\mathbf{v}_{eAN})_1 - (\mathbf{v}_{eBN})_1]}$$

15. What is the definition of an impulsive force in contrast to a non-impulsive force? _____

