

**KING FAHD UNIVERSITY OF PETROLEUM AND MINERALS**  
**DEPARTMENT OF PHYSICS**  
**PYP – 001- Section 03**

Name: **Key**

I.D. #

QUIZ No. 3

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- 1- A railroad diesel weights four times as much as a freight car. If the diesel engine coasts at 5 Km/h into a freight car that is initially at rest, how fast do the two coasts after they couple together?

**Answer:**

According to the conservation the momentum:

The momentum of the two cars before the collision = the momentum of couple cars after the collision

$$m_1v_1 + m_2v_2 = (m_1 + m_2) v$$

⇒ Assume the mass of the fright car is m Kg, therefore the mass of the railroad is 4m Kg.

$$(4m \times 5) + (m \times 0) = (4m + m) v \Rightarrow 20m = 5m v \Rightarrow v = 4 \text{ Km/h}$$

- 2- Which pair contains one **vector** and **scalar**?

- A. displacement and acceleration
- B. force and kinetic energy
- C. momentum and velocity
- D. power and speed
- E. all answer are wrong