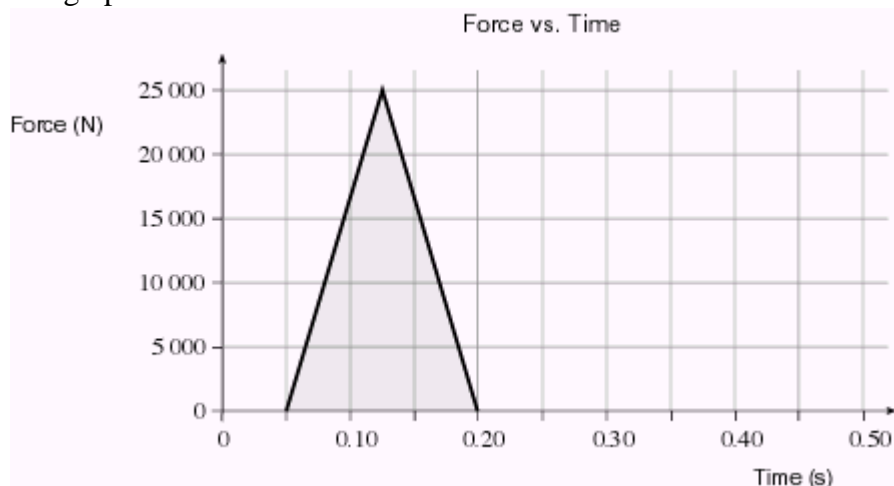**Use the following information to answer the next 2 questions.**

During a motor vehicle accident an unbelted passenger experienced a force which varied with time as shown on the graph.

Force vs. Time

Force (N)

25 000

20 000

15 000

10 000

5 000

0

0   0.10   0.20   0.30   0.40   0.50

Time (s)

1. Calculate the area of the shaded region in the graph.

2. What does this area represent?

3. What is an equivalent unit for impulse?
    A. m/s
    B. kg•m/s
    C. kg•m/s^2
    D. N

4. A 3.0 kg frictionless puck is at rest on a level table. It is pushed straight north with a constant force for 1.50 s and then let go. The speed then is 5.0 m/s. The magnitude of the force which caused this change in motion was:
    A. 10 N
    B. 2.5 N
    C. 22.5 N
    D. 15 N

5. Which of the following is conserved for elastic collisions?
    A. speed
    B. kinetic energy
    C. force
    D. potential energy

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6. Which of the following best represents the momentum of a small car travelling at a city speed limit?
   A. 1 000 000 kgm/s
   B. 1 000 kgm/s
   C. 10 000 kgm/s
   D. 100 000 kgm/s

7. The momentum of a male Olympic sprinter is about
   A. 100 kg•m/s
   B. 10 kg•m/s
   C. 10 000 kg•m/s
   D. 1000 kg•m/s

8. A stone falls off a cliff. Air friction is negligible. As the stone falls its momentum is
   A. decreasing, then constant.
   B. increasing, then constant.
   C. increasing.
   D. constant.

9. A 5.0 kg mass A, moving at 3.0 m/s to the right, has a head-on collision with a 2.0 kg mass B, moving 4.0 m/s to the left. The 2.0 kg mass bounces back with a velocity of 2.0 m/s to the right. Find the velocity of the 5.0 kg mass after impact.

10. A 0.05 kg bullet moving vertically upwards at 125 m/s hits a stationary 2.6 kg block hanging from a 5.00 m long string. Calculate the maximum height that the block reaches assuming that the bullet remains within the sandbag.