<Multiple choice Types> There is only one correct answer per each question. Mark your answer choice on the OMR answer sheet.

For each correct answer, you will get the points indicated next to each question number.

No penalty point is applied to an incorrect answer.

---

1. The area of the *F-x* graph corresponds to the work done on the object. That is,

$$W = \int_0^{4\,\text{m}} F\,dx = 8\,\text{J} + 4\,\text{J} = 12\,\text{J}.$$

Answer)   **12 J**

2. The electromotive force induced across the moving rod in magnetic field B is $\varepsilon = BLv$.

Therefore, $\varepsilon = 2.0\,\text{T} \times 1.0\,\text{m} \times 5.0\,\text{m/s} = 10\,\text{V}$.

Thus, the current in the loop is

$I = \varepsilon/R = 10\,\text{V}/4\,\Omega = 2.5\,\text{A}$.

Answer)   **2.5 A**

3. The total momentum of the system must remain constant, thus we examine the total momentum before and after collision.

Total momentum before collision:

$0.20\,\text{kg} \times 100\,\text{m/s} + 4.8\,\text{kg} \times 0\,\text{m/s} = 20\,\text{kg m/s}$

If the speed of the wood block embedded with the bullet is V, total momentum after collision:

$(0.2\,\text{kg} + 4.8\,\text{kg}) \times V$

By using the momentum conservation, we find V,

$$V = \frac{20\,\text{kg m/s}}{5.0\,\text{kg}} = 4.0\,\text{m/s}$$

Answer)   **4.0 m/s**