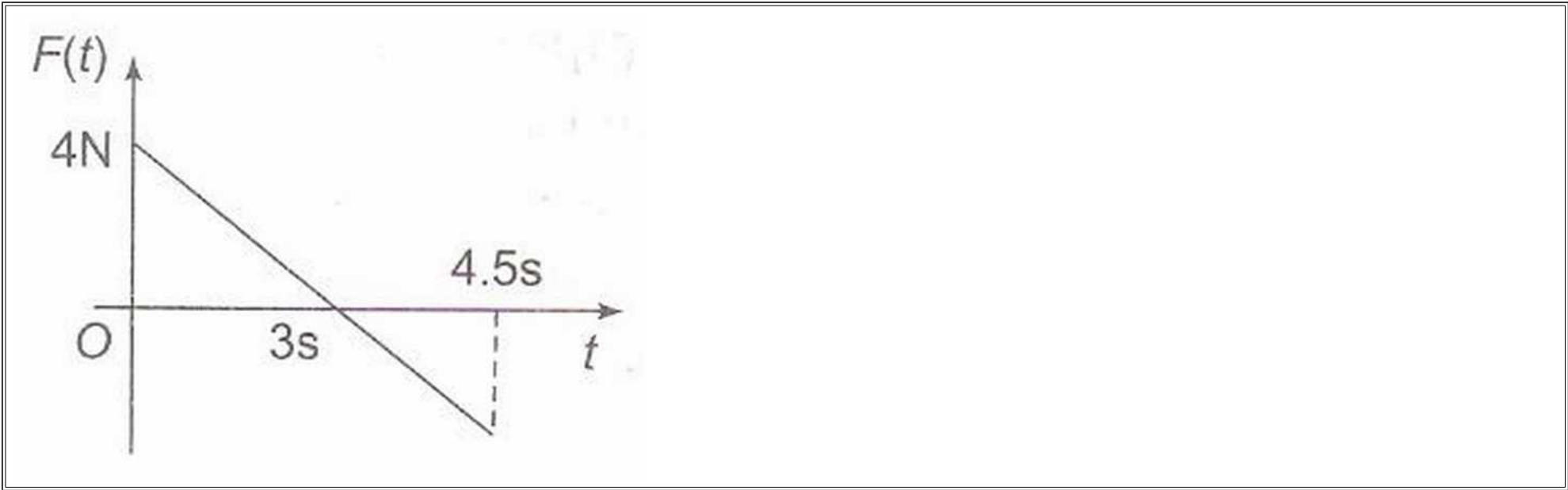


Previous Years IIT Problems

Single Answer

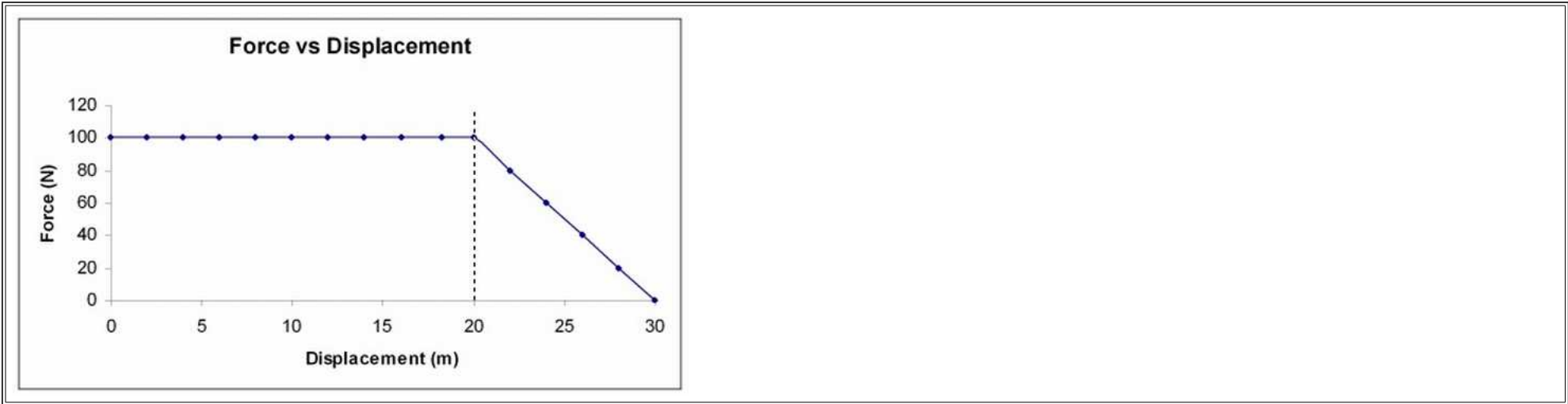
Example: A block of mass 2 kg is free to move along the x-axis. It is at rest and from $t=0$ onwards it is subjected to a time-dependent force $F(t)$ in the x direction. The force $F(t)$ varies with t as shown in the figure. The kinetic energy of the block after 4.5 seconds is



- a) 4.50J
- b) 7.50J
- c) 5.06J
- d) 14.06J

Review Questions I Refer to the following information for the next thirteen questions. [?]

A 5.0-kg mass is pushed along a straight line by a net force described in the graph below. The object is at rest at $t = 0$ and $x = 0$.



- a) During which displacement interval was the object's acceleration uniform?
- b) What acceleration did the object experience when $x = 10$ meters?
- c) How much work was done on the object during the first 20 meters?
- d) How much kinetic energy did the object gain during the first 20 meters?
- e) What was the object's instantaneous velocity at $x = 20$ meters?
- f) How much time was required to move it through the first 20 meters?
- g) How much did the object's momentum change in the first 20 meters?
- h) What was the object's instantaneous acceleration at $x = 22$ meters?
- i) Why can't the kinematics equations for uniformly accelerated motion be used to calculate the object's instantaneous velocity at $x = 30$ meters? What method should be used?
- j) How much work was done to move the object from 20 meters to 30 meters?
- k) What was the object's instantaneous speed at $x = 30$ meters?
- l) What was the total impulse delivered to the object from $x = 0$ to $x = 30$ meters?
- m) What percent of the impulse was delivered in the last 10 meters?