2023 IUT Admission Test(SOCIE)

Physics Examination(Sample)

<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.

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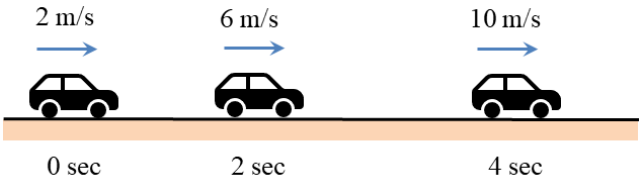
1. [4 points]

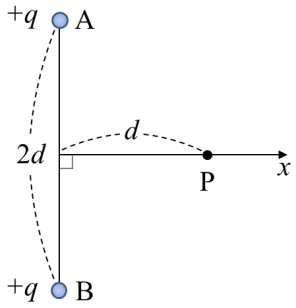
The figure shows the speed of a car moving in a straight line with constant acceleration as a function of time. What is the speed at 3 seconds?



① 6.5 m/s ② 7 m/s ③ 8 m/s
④ 8.5 m/s ⑤ 9 m/s

2. [5 points]

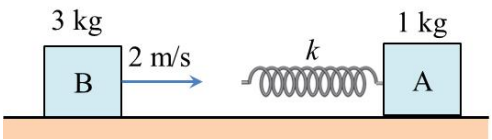
As shown in the figure, two charges at points A and B, each with charge $+q$, are fixed at a distance of $2d$ on the horizontal plane. Point P on the perpendicular bisector of A and B is separated by d from line AB. What is the strength of the electric field at point P? (ε_0 is the permittivity in vacuum.)



① $\frac{1}{4\pi\varepsilon_0}\frac{q}{d^2}$ ② $\frac{1}{4\pi\varepsilon_0}\frac{q}{\sqrt{2}d^2}$ ③ $\frac{1}{4\pi\varepsilon_0}\frac{\sqrt{2}q}{d^2}$
④ $\frac{1}{4\pi\varepsilon_0}\frac{q}{2d^2}$ ⑤ $\frac{1}{4\pi\varepsilon_0}\frac{2q}{d^2}$

3. [6 points]

As shown in the figure, an object B with a mass of 3 kg moves to the right at a speed of 2 m/s from the left side of an object A with a mass of 1 kg connected to a spring placed on a horizontal frictionless surface. The object B compresses the spring after touching it. What is the compressed length of the spring when it is compressed to its maximum? (Here, the spring constant $k = 48\ \mathrm{N/m}$, and the mass of the spring and all friction are ignored.)



① 0.25 m ② 0.5 m ③ 1 m
④ 1.5 m ⑤ 2 m