Name: _____ Date: _____

IB SL Physics: 1-D Kinematics

DIRECTIONS: Answer all questions and show all work where possible

1. This question is about kinematics.

(a) State the difference between average speed and instantaneous speed. [2]

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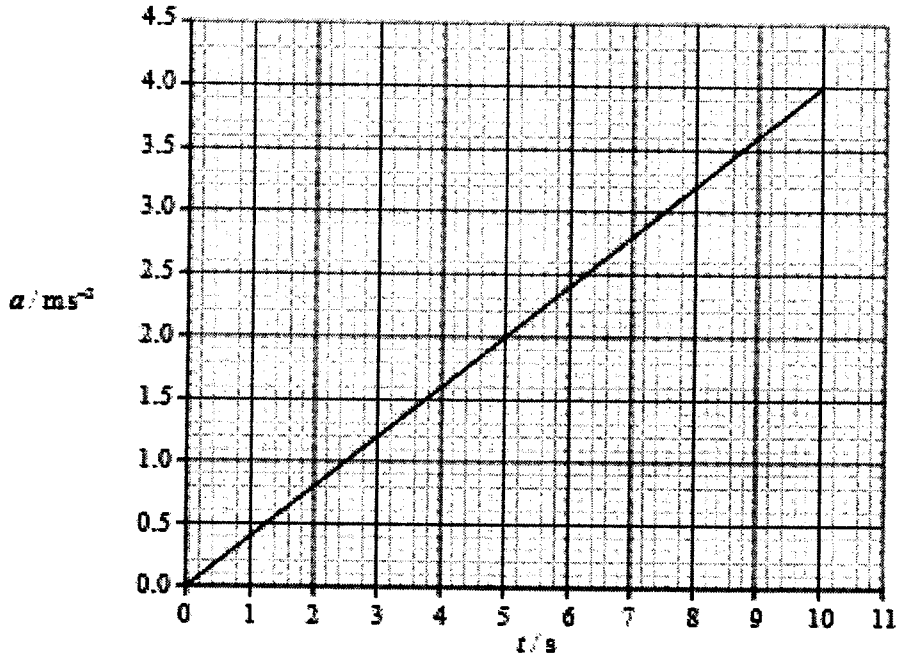
(b) The graph shows how the acceleration a of a particle varies with time t.



At time $t = 0$ the instantaneous speed of the particle is zero.

(This question continues on the following page)

(Question 1 continued)

(i) **Calculate the instantaneous speed of the particle at $t = 7.5$ s.** *[2]*

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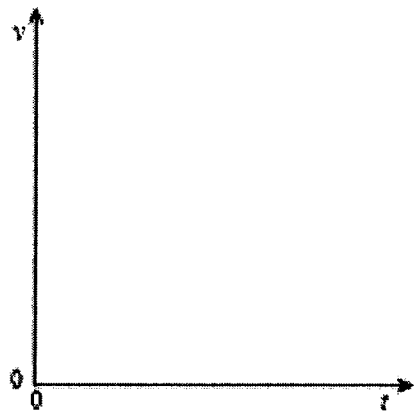
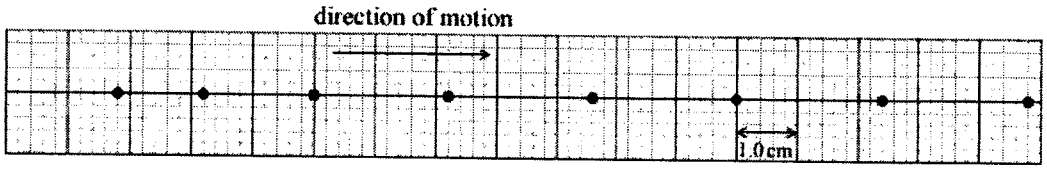
(ii) **Using the axes below, sketch a graph to show how the instantaneous speed v of the particle varies with t.** *[1]*



Question 2. Parts a and b

A car moves along a straight road. At time $t=0$ the car starts to move from rest and oil begins to drip from the engine of the car. One drop of oil is produced every 0.80 s. Oil drops are left on the road. The position of the oil drops are drawn to scale on the grid below such that 1.0 cm represents 4.0 m. The grid starts at time $t=0$.



(a) (i) State the feature of the diagram above which indicates that, initially, the car is accelerating. *[1]*

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(b) Using information from the grid above, determine for the car,

(i) the final constant speed. *[2]*

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