

D 14%

1.5 There are ... atoms of hydrogen in 36g of H_2O .

- A 2.4×10^{24}
- B 6×10^{23}
- C 4.8×10^{24}
- D 6×10^{24}

[10]

QUESTION 2

An aeroplane flew in the following manner: 200km west, 150km south and then 180km east.

- 2.1 ~~Draw a vector diagram to show the displacement of the aeroplane.~~ (3)
- 2.2 ~~Calculate the magnitude of the displacement of the aeroplane.~~ (3)
- 2.3 ~~What is the final velocity of the aeroplane with respect to the starting position?~~ (2)
- 2.4 If the plane took 55min to complete this journey, determine the average speed it flew by. (3)

[11]

QUESTION 3

A car drips oil. The driver pulls out of his driveway and leaves a set of oil drops on the road as he travels. The oil drops are dropped every half a second. The distance of the drops can be recorded as follows:

Drop point	Distance from starting point
A	0m
B	1m
C	4m
D	9m
E	16m
F	25m

- 3.1 Use the graph to calculate the acceleration of the car. (5)
- 3.2 ~~Calculate the average velocity of the car between points A and F.~~ (4)
- 3.3 Calculate the magnitude of the velocity at point E. (3)
- 3.4 ~~Calculate the acceleration of the car at point E.~~ (4)

[10]

QUESTION 4

The velocity vs. time graph below illustrates a part of a mom's journey, dropping her kids off at school.



NO EQUATIONS OF MOTION SHOULD BE USED IN ANSWERING THE FOLLOWING QUESTIONS.

- 4.1 ~~Calculate the acceleration of the vehicle between 0s and 10s.~~ (3)
- 4.2 ~~What is the speed of the vehicle at 20s?~~ (1)
- 4.2 Use the graph to calculate the acceleration at the following intervals:
 - 4.2.1 ~~Between 0s and 10s.~~ (2)
 - 4.2.2 ~~Between 10s and 20s.~~ (2)
- 4.3 Use the graph to calculate the total displacement of the vehicle. (10)

[10]

QUESTION 5

A vehicle starts from rest and accelerates in a southerly direction at $3m/s^2$.

- 5.1 ~~Calculate the distance travelled by the vehicle after 5s.~~ (2)
- 5.2 ~~Calculate the velocity of the vehicle after 5s.~~ (3)
- 5.3 ~~Calculate the distance travelled by the vehicle after 5s.~~ (3)
- 5.4 ~~Calculate the average velocity of the vehicle.~~ (3)

[11]

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Christian Drosten



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