

THREE STEPS TO EXAM MARKS

Write out the **equation** in full
Rearrange it if you need to using your
Formula triangle

Put in the **data/numbers** you have been given
In the question.
Check they are in the **correct positions**.

Do the calculation.
Write the answer clearly and
Don't forget the **UNITS**.

Remember the 3 step method for equations – YOU MUST DO THIS TO GET FULL EXAM MARKS!!

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⇒NCTB⇒GRADE-IX OR X⇒IX-X-MP-CH-07

Mathematical Problems | Waves



Question:

Find the wave speeds....

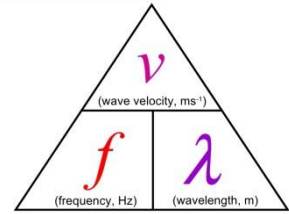
- 1) Wavelength = 3m, Frequency = 100Hz

$$v = f\lambda$$

=

$$= 300\text{ms}^{-1}$$

Ans.: 300ms^{-1}



Here,

$$\lambda = \dots$$

$$f = \dots\dots$$

$$v = ?$$

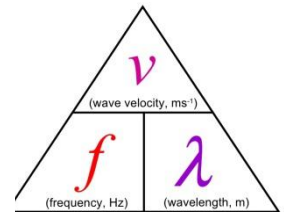
Find the Wavelength

- 2) wave speeds = 270kms^{-1} , Frequency = 135 MHz

$$v = f\lambda$$

$$\lambda = \frac{v}{f}$$

Ans.: m



Here,

$$v = \dots\text{ms}^{-1}$$

$$f = \dots\text{Hz}$$

$$\lambda = ?$$

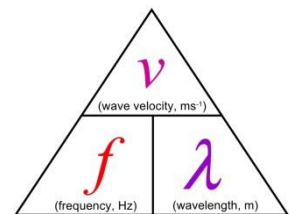
Find the Frequency

- 3) Wavelength = 0.5nm , wave speeds = 350ms^{-1}

$$v = f\lambda$$

$$f = \frac{v}{\lambda}$$

Ans.: Hz or s^{-1}



Here,

$$\lambda = \dots\text{m}$$

$$v = \dots\text{ms}^{-1}$$

$$f = ?$$

Question: Which quantity does change when a wave travels from one medium to another?

Sound of frequency 1 kHz is produced by a tuning fork. It was allowed to pass through air, water and iron.

Medium⇒	air	water	iron
Frequency	1000Hz	1000HzHz
Velocity	334 m/s m/s	5130 m/s
Wavelengthm	1.49m	5.13m

Question: Which quantity does change and why ?

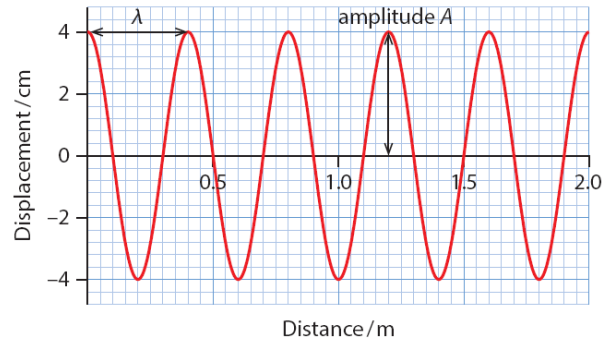
Energy ⇒	Light	X-RAY	Microwave
Frequency	430HzEHz	30MHz
Velocity m/s	300000km/s	3x10 ⁸ m/s
Wavelength	70nm	10pmm

Conclusion:

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Important pieces of information from i. displacement–distance graph and

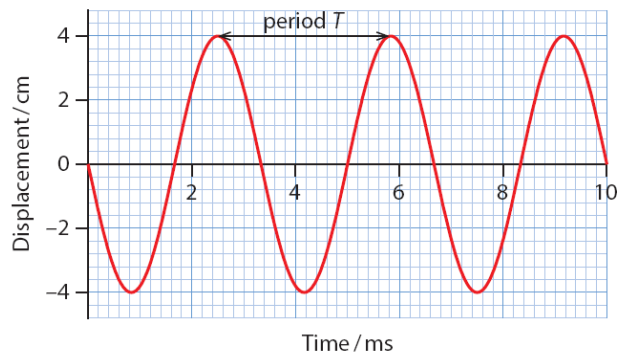
Find the i. amplitude, ii. wavelength and iii.
the number of wavelength



A graph of displacement versus position

ii. Displacement–time graph

Find the i. amplitude, ii. time
period and iii. Frequency

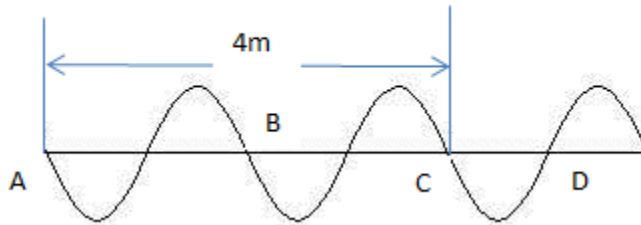


A graph of displacement versus position

BOOK Topic: 7.2.3

Try three questions of Example.

CQ:



Time require to move from A to B is 0.1 s

- What is called wave velocity?
- What is the type of wave in the stem? Explain.
- Calculate the frequency of the wave.
- Is there in any change of frequency if the wavelength made half keeping the amplitude constant? Analyze mathematically