Physical Science   Grade 10

Transverse and longitudinal waves test   14 April 2020

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Instructions:

   ✓ Write all numbers with a **comma** eg 0,71

   ✓ **Do not** leave spaces **between the number and the unit** eg 0,71Hz

   ✓ If there are two steps to a calculations, there will be two blocks provided. Fill in the first answer first and then the final answer last.

   ✓ Meters per second can be written as **m.s-1**

   ✓ Round final answers off to **2 decimal places**

   ✓ If an answer is 1, then write it as 1,00

   ✓ When answers are very small (below 0,01) then write the answer in **scientific notation** and still round off to **two decimal places**

_____

Section A: Choose the correct option from the given options

1.1   Sound travel faster through a   gas   liquid   or   solid

1.2   If the wavelength of a wave doubled, what would happen to the frequency

     It would double   It would halve

1.3   The relationship between frequency and wavelength is:

     inversely proportional directly proportional

1.4 If the speed of a sound wave in air doubles, then what would happen to the frequency

It would double   It would halve

1.5 The relationship between speed and frequency is:

inversely proportional directly proportional

[1 x 5 =5]

Section B: Theory (spelling counts)

Answer the following theory questions

Question 1: Fill in the missing words

1.1 A transverse waves is a wave in which the particles in the medium move

_____ to the direction of propagation (movement) of the wave.   (1)

1.2 A longitudinal waves is a wave in which the particles in the medium move

_____ to the direction of propagation (movement) of the wave.   (1)

1.3 The distance between 2 consecutive points in phase on a wave is known as

the _____

1.4 The maximum distance a medium is displaced from its rest position is known

as the _____

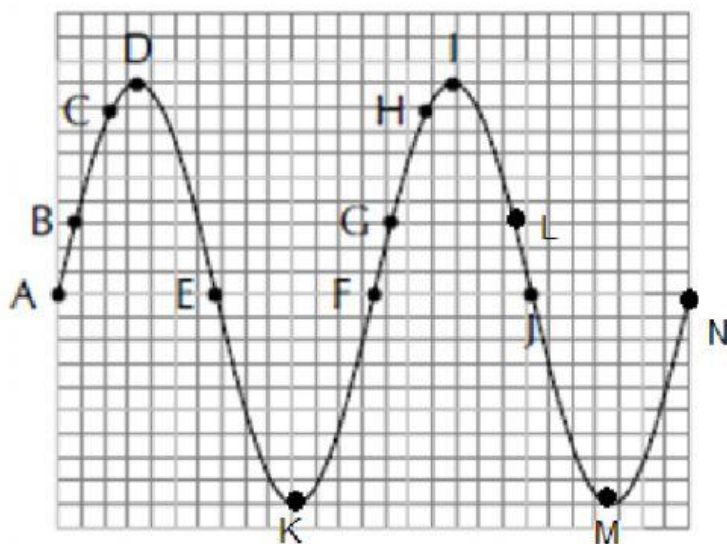1.5 When 2 pulses meet and it results in a bigger pulse forming this is knows as

_____ interference.

■LIVEWORKSHEETS

1.6   The above is known as the principle of _____

For question 1.8 and 1.9 consider the diagram below

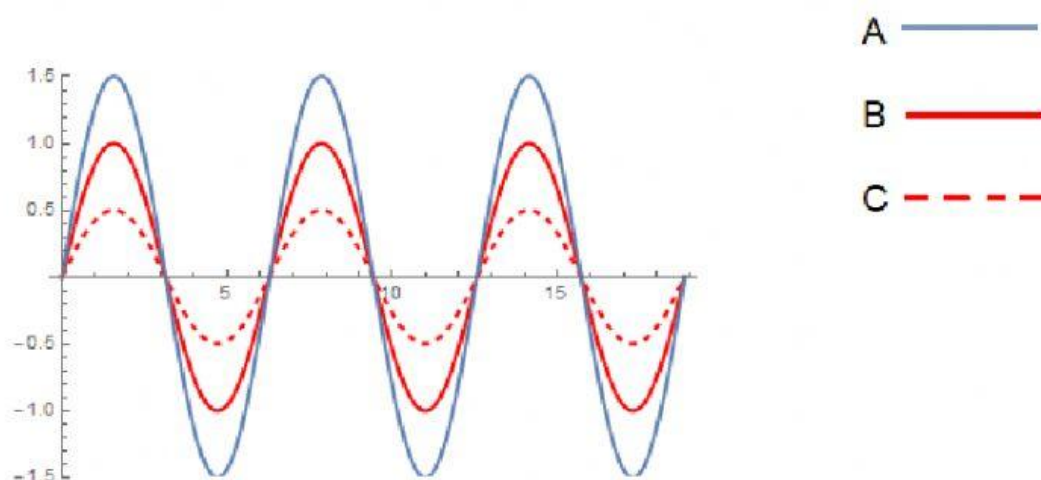1.8   Points E and J are said to be _____ phase

1.9   Points E and F are said to be _____ phase.

1.10   A _____ is a region on a longitudinal waves where

particles are furthest apart.

For question 1.11 consider the diagram below.

1.11 Which graph shows the sound wave with the highest volume (only write A, B

or C._____

[1 x 11 = 11]

Section C: Calculations

Question 1: only write the answers to the following questions.

Remember to leave no spaces between numbers and units and use comma's for decimal numbers

20 waves are produced in 2 seconds

1.1   Determine the frequency of the wave   (1)

1.2   The period of the wave   (1)

2.   If a wave covers 30 m in 2 mins, calculate the speed of the wave   (1)

3.   If the speed of a wave is 40m.s^{-1} and the wavelength is 40nm, calculate the

       frequency of the wave.   Unit   (2)

Value

       _____   X 10^9 _____

4.   Calculate the wavelength of a wave that travels 30 km in 2 mins and has a

       frequency of 30MHz. **(This is a two-step calculation. Write the answer to**

       the first step in the first block and final answer in the last blocks.)   (3)

              =

              =   _____   X 10^{-6} _____

5. Calculate the wavelength of a wave that is travelling at 70m.s⁻¹ and has

   period of 0,2 s. **(This is a two-step calculation. Write the answer to the**

   first step in the first block and final answer in the last blocks.) (2)

   =

   =

6. A wave has a speed of 40 km.h⁻¹ and a wavelength of 50pm

6.1 convert the speed into m.s⁻¹ (round off to 2 decimal places) (1)

6.2 calculate the frequency of the wave (round off to 2 decimal places) (1)

6.3 calculate the period of the wave (1)

7. If Sarah screams in the grand canyon and the sound wave takes 4 seconds to

   echo to her from a mountain top, determine how far it is away from her to the

   mountain top. (speed of sound in air is 340 m.s⁻¹) (1)

8. Pumla stands on the pier and sees 5 wave crests pass him in 12 seconds.

   Determine the wavelength of the wave if the speed of the wave is 20m.s⁻¹ (1)

9. If 4 waves crests pass a point in 15 seconds and the speed is 10 m.s^{-1},

    determine the wavelength of the wave. (1)