Physical Science Grade 10

Transverse and longitudinal waves test 14 April 2020

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

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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.

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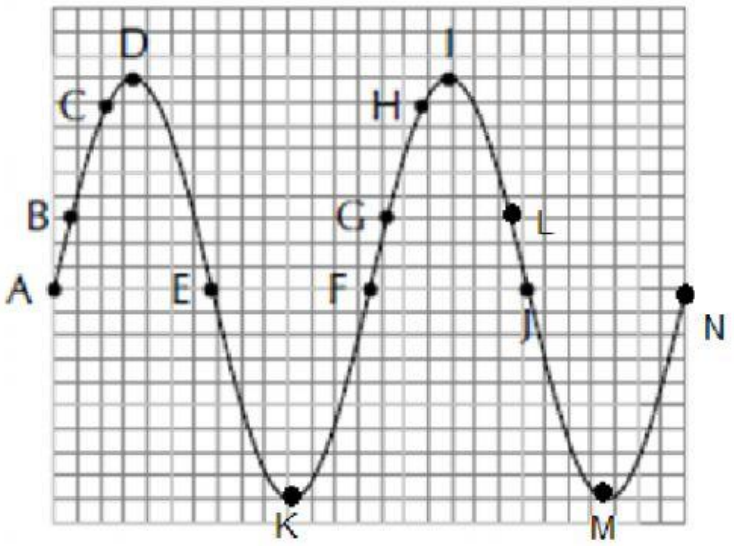
1.6 The above is known as the principle of _____

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.

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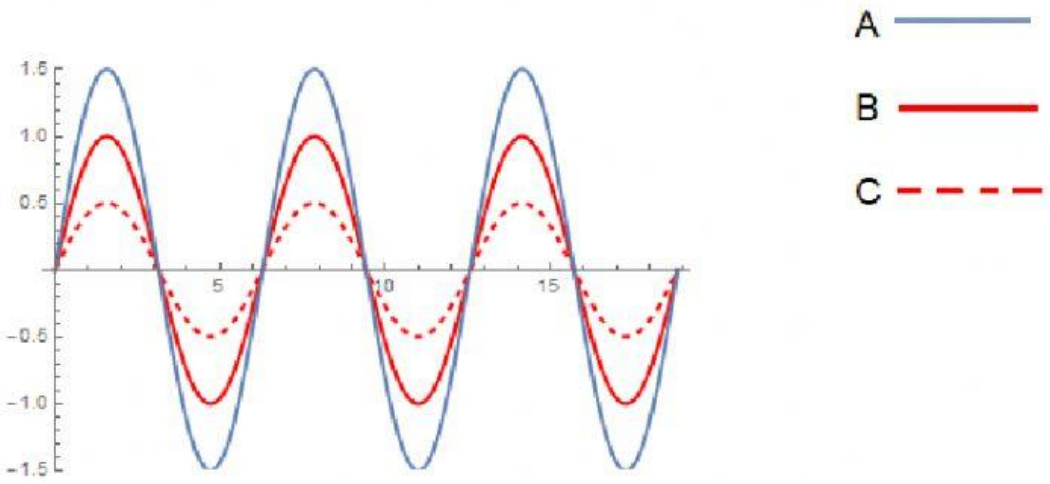
For question 1.11 consider the diagram below.



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

[1 x 11 = 11]

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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. (2)

Value → _____ X 10^{9} _____ ← Unit

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} _____

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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)

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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)

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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)

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