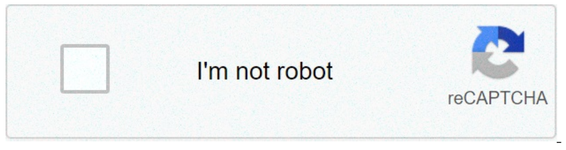

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Coherent and incoherent addition of waves

Coherent and incoherent addition of waves class 12. Coherent and incoherent addition of waves derivation. What is coherent and incoherent scattering. Coherent and incoherent addition of waves class 12 notes. What is coherent and incoherent. Coherent vs incoherent waves. What is coherent wave.

Physics Multiple-choice questions on “Coherent and inconsistent wave addition”. 1. Which of the following forms of light is a form of light whose photons share the same frequency and whose wavelengths are in phase with each other?a) Coherent sourcesb) Incoerentic sources) Electromagnetic waves) SunlightAnswer: a Clarification: Coherent light is a form of light whose photons share the same frequency and whose wavelengths are in phase with each other? the same frequency and whose wavelengths are in phase with each other. The phase difference between the waves shall be constant for coherent sources. To continue using our site, we ask you to confirm your personal identity. Thank you so much for your cooperation. constant frequency and phase differencefrequency only amplitude and same length of amplitude only Option 1: Constant frequency and phase difference Monochromatic light: 1). Monochromatic light is single-frequency light. 2). Two sources are said to be coherent if the waves emitted by them have the same frequency and constant phase difference. 3). The interference of these waves occurs continuously, the random beam light waves constantly produce bright and dark fringes at every point. 4). A point that has a dark fringe at one moment can have a bright fringe at the next moment. This cancels out the interference effect, and we only see an average brightness value. Example of a consistent source: 1). Laser light is an example of a coherent light source. The light emitted by laser light has the same frequency and phase. 2). Sound waves are another example of coherent sources. The electrical signals of the sound waves travel with the same frequency and phase. IndiaÃ¢Æs #1 Learning Platform Start the Comprehensive Test Preparation for the Test Daily Live MasterClasses Practice Question Bank Mock Test & Quiz Start for free Download App Trust of 2,17,86,130+ Students Same widthSame width and wavelength.Same wavelength. Option 4: Sa Concept: Consistent Source: Ã Ã Ã Ã Ã Ã Ã Ã Ã Ã Ã Ã Ã Two sources are considered to be perfectly coherentÃ¨ if the frequency/wavelength and the waveform of the sources are identicalÃ¨ and their phase difference is constant.Ã¨ Being an S coherent source is an ideal property of waves that allows a constant and temporal space) is interference. Explanation: If two sources have constant phase differences (i.e. the phase difference between two waves does not change with respect to time) and the same wavelength. They are consistent sources of waves. So the correct answer is Option 4. IndiaÃ¢Æs #1 Learning Platform Take the full exam Preparation for the exam Daily Live MasterClasses Practice Question Bank Mock Test & Quiz Start for free Download App Trusted by 2,17,86,130+ Student attendance and phase difference constantfrequency onlywidth and same length of wavewidth only Option 1: Free Constant phase difference and frequency Monochromatic light: 1). Monochromatic light is single-frequency light. 2). Two sources are said to be coherent if the waves emitted by them have the same frequency and constant phase difference. 3). The interference of these waves occurs continuously, the random beam light waves constantly produce bright and dark fringes at every point. 4). A point that has a dark fringe at one moment can have a bright fringe at the next moment. This cancels out the interference effect, and we only see an average brightness value. Example of a consistent source: 1). Laser light is an example of a coherent light source. The light emitted by laser light has the same frequency and phase. 2). Sound waves are another example of coherent sources. The electrical signals of the sound waves travel with the same frequency and phase. IndiaÃ¢Æs #1 Learning Platform Take the Full Test Preparation Daily Live MasterClasses Practice Question Bank Mock Test & Quiz Start for Free Download App Trusted By FREQUENZENTALISTURE Dâ € ™ ™ ™ UnderTrambi 1 and 2NEU of these concepts: consistent sources: consistent light sources are those sources that emit a luminous wave having the same frequency, length of wave and in the same phase or have a constant phase difference . Ã ¢ â ~~ consistent light sources have the following features: Ã ¢ â â ¢ â ¢ The generated waves have a constant phase difference (they are in phase between them) the waves are of a single frequency and length Wave. The waves should have the same amplitude. Â Â «Explanation: The consistent light sources are those that emit a luminous wave with the same frequency, wave length and in the same phase or have a constant phase difference. Therefore, the option 3 is correct. IndiaÃ ¢ Â|s # 1 learning platform starts the complete exam preparation daily live masterclasses practice question bank mock test & quiz download free app trusted by 2,17,86,130+ students concept: consistent addition of waves: the phenomenon in which Two or more waves overlap to form a resulting wave of greater, minor, or the same amplitude is called interference. The interference is based on the superimposed principle according to which at a certain point of the vehicle, the resulting movement produced by a number of waves ì ì the vector sum of the displacements produced by each of the waves. Leave two s1ã, and s2ã, they are consistent. That the intensity of the waves is me. For constructive interference: if at some point the waves that emerge from the S1Ã, and s2ã source, are in phaseo, then we will have a constructive interference and the resulting intensity will be 4. Ã ¢ â ¢ Ã Ã, difference of path = nÃžâ »en = 0,1,2,3 ... for destructive interference: if at any point the waves that emerge from the S1Ã, and s2ã, are In the opposite phase, then we will have a destructive interference and the resulting intensity will be zero. Ã «F Ã ¢ Ã, Path difference = Ã, (Left (N + Frac {1} {2} Right) ÃžÂ» en = 0,1,2,3 ... , ÃžÂ »= Length of wave implants: GivenÃ, y1ã, = a.cos (â ‰ t) andÃ, y2ã, = 2a.cos (â ‰ t) if the two waves suffer a one ™ constructive interference, then the resulting movement is given as, Ã ¢ ¢ y = y1ã, + y2 Ã ¢ â ¢ y = Ã, cos (â ‰ t) + ã, 2a so ã, ã, ã, ----- (1) with the equation 1, the width â € ™ A 'of the resulting wave is given as, «f' a = 3a therefore, the option 3 is correct . India ¢ â¡Â¡s # 1 learning platform starts the complete exam preparation of the daily live masterclasses exam practice questions bank tests and quiz download free app free of 2.17.86.130+ students 2a sin (frac { PHI} {2} Right) 2a Cos ({2} Right) Concept: Consistent addition of waves: the phenomenon in which two or more waves overlap to form a resulting wave of larger width, less than or equal is called interference. The interference is based on the superimposed principle according to which at a certain point of the vehicle, the resulting movement produced by a number of waves ì ì the vector sum of the displacements produced by each of the waves. Leave two s1ã, and s2ã, they are consistent. That the intensity of the waves is me. For constructive interference: if at some point the waves that emerge from the S1Ã, and s2ã source, are in phaseo, then we will have a constructive interference and the resulting intensity will be 4. Ã ¢ â ¢ Ã Ã, difference of path = nÃžâ »en = 0,1,2,3 ... for destructive interference: if at any point the waves that emerge from the S1Ã, and s2ã, are In the opposite phase, then we will have a destructive interference and the resulting intensity will be zero. Ã «F Ã ¢ Ã, Path difference = Ã, (Left (N + Frac {1} {2} Right) Ãžâ» en = 0,1,2,3 , ÃžÂ »= wave length Let the phase difference between the trips of the two waves is, Ã ¢. So the shift of the two waves is given as, Ã ¢ âžâžy1, = Ã, a.cos (â Ã ‰ t) Ã ¢ â ¢ â ¢ Ã, y2ã, = a.cos (â ‰ T + Ã ¢) y=2acos\left (\frac{\phi}{2} \right) cos\left (\omega t+ \frac{\phi}{2} \right) \) The magnitude of the resulting displacement is given as, \ (\Rightarrow A=2acos\left (\frac{\phi}{2} \right) \) The Thea intensity at which point is given as, \ (\Rightarrow I=4I_ocos^2\left (\frac{\phi}{2} \right) \) Explanation: Given that y1Ã¨ = a.cos (ÃÂ¤t), and y2Ã¨ = a.cos (ÃÂ¤¤¤t + Ã) We know that if the two waves overlap, then the The state of the resulting shift is given as, \ (\Rightarrow A=2acos\left (\frac{\phi}{2} \right) \) So option 2 is correct. IndiaÃ¢¦Â¦s #1 Learning Platform Start the full exam Preparation for the exam Daily Live MasterClasses Practice Question Bank Tests and Quizzes Start for free download App Trust of 2,17,86,130+ Students A\ (\sqrt 3A\) \ (\frac{A}{2}\) None of These CONCEPT: Consistent addition of Waves: The phenomenon in which two or more waves overlap to form a resulting wave of greater, lesser or equal amplitude is called interference. Interference is based on the principle of overlap according to which, at a given midpoint, the resulting displacement produced by a given number of waves is the vector sum of the displacements produced by each of the waves. Let two wave sources S1Ã¨ and S2Ã¨ are consistent. Let the intensity of the waves be Io. For constructive interference: If at some point the waves emerging from the two coherent sources S1Ã¨ and S2Ã¨ are in phase, then we will have a constructive interference and the resulting intensity will be 4Io. Â”Path difference = nÃ©Â” and n = 0,1,2,3,... For destructive interference: If at any point the waves emerging from the two coherent sources S1Ã¨ and S2Ã¨ are in opposite phase, then we will have a destructive interference and the resulting intensity will be zero. Â”F is Difference in path =\ (\left (n+\frac{1}{2} \right) \) e n = 0,1,2,3,... Where is = wavelength Let at any point the phase difference between the displacements of the two waves beÃ¢. Then the displacement of the two waves is given as, Ã¢Â¢¢ y1Ã¨ =Ã¨ a.cos (Ã¢t) Ã¢Â¢Â¢Â¢Â¢Â¢y2Ã¨ = a.cos (ÃÂ¢t + ÃÂ¢) When the waves are superimposed at this point the resulting displacement is given as, \ (Ã¢¢¢¢ y=2acos\left (\frac{Ã Â¢}{2} \right) cos\left (\omega t+ \frac{Ã^}{2} \right) \) The magnitude of the resulting displacement is given as, \ (Ã¢¢¢¢ A=2acos\left (\frac{Ã }{2} \right) \) The intensity at that point is given as, \ (Ã¢¢¢Â¢ I=4I_ocos^2\left (\frac{~~}{2} \right) \) CALCULATION: given Amplitude a = A, e Ã Ã Ã Ã Ã ^^^^^^\ (\frac{\pi}{3}\) The resulting amplitude in that point is given as, \ (f Ã¢ A'=2acos\left (\left (\left (\frac{Ã }{Ã }{2}{2} \) \ A'=2Acos\left (\frac{\pi}{6} \right) \ (Ã¢ A'=2A\times \frac{\sqrt3}{2}\) \ (Ã¢ A'=\sqrt3A\) “So, Option 2 is correct. IndiaÃ¢Æs #1 Learning Platform Take the Full Test Daily Preparation MasterClasses Practice Questions Bank Tests and quizzes Start the free download Trusted app of 2.17.86,130+ students \ (\frac{\pi}{6}\) \ (\frac{\pi}{4}\) \ (\frac{\pi} {3}\) None of these Options 3: \ (\frac{\pi}{3}\) CONCEPT: Consistent addition of waves: The phenomenon where two or more waves overlap to form a resulting wave of greater, lesser or equal amplitude is called interference. Interference is based on the principle of overlap according to which, at a given midpoint, the resulting displacement produced by a given number of waves is the vector sum of the displacements produced by each of the waves. Let two wave sources S1Ã¨ and S2Ã¨ are consistent. Let the intensity of the waves be Io. For constructive interference: If at some point the waves emerging from the two coherent sources S1Ã¨ and S2Ã¨ are in phase, then we will have a constructive interference and the resulting intensity will be 4Io. Â”Path difference = nÃ©Â” and n = 0,1,2,3,... For destructive interference: If at any point the waves emerging from the two sources S1Ãã, and s2Ã, are in the opposite stage, then we will have destructive interference and the resulting resulting It will be zero. Â ‡ 'Height difference = (Left (N + Frac {1} {2} right) Step between the trips of the two waves is ï †. So the shift of the two waves is given as, Â ‡ 'y1 = a.cos (ï ‰ t) ‡' y2 = a.cos (ï ‰ t + ï †) when the waves are superimposed at this point Shift resulting is given as, (‡ 'y = 2acos left (frac {ï †} {2} right) cos left ( ) The resulting displacement amplitude is given as, (‡ 'a = 2acos left (frac {ï †} {2} right) The intensity at that point is given as, Â ‡ 'i = 4i_ocos ^ 2 {2 ï ï †} {2} {† {2} right) (Â ‡ 'i = 4i_ocos ^ 2}} {2}} {2}}) (‡' 3i_o = 4i_ocos ^ 2 Left ( ) Then, option 3 is correct. # 1 Learning platform of India Start preparation complete daily exam MasterClasses Practice Question Bank Mock Tests & Quizzes Get Started For Free Download App Trusted by 2,17,86,130+ students ( ) (Interference is based on the overlapping principle according to which in a particular point of the vehicle, the resulting movement produced by a series of waves is the vector sum of the displacements produced by each of the waves. Let two S1 and S2 wave sources are consistent. That the intensity of the waves are me. For constructive interference: if any point the waves that emerge from the two consistent S1 and S2 sources are in phase then we will have constructive interference and the resulting intensity will be 4. Â ‡ 'Difference path = nî »en = 0,1,2,3 ... by destructive interference: if at any point the waves that emerge from the two consistent sources S1 and S2 are in the opposite stage then we will have destructive interference and l 'resulting intensity will be zero. Â ‡ 'Height difference = (Left (N + Frac {1} {2} right) Step between the trips of the two waves is ï †. So the shift of the two waves is given as, Â ‡ 'y1 = a.cos (ï ‰ t) ‡' y2 = a.cos (ï ‰ t + ï †) when the waves are superimposed at this point Shift resulting is given as, (‡ 'y = 2acos left (frac {ï †} {2} right) cos left ( ) The resulting displacement amplitude is given as, (‡ 'a = 2acos left (frac {ï †} {2} right) The intensity at that point is given as, Â ‡ 'i = 4i_ocos ^ 2 {2 {ï †} {2} {† {2} right) Consistent S1 and S2 are in phase then we will have constructive interference and the resulting intensity will be 4. Therefore, to point A, the resulting intensity is given as, Â № = 4IO ----- (1) to point B: (ï † = (frac {{} {3} The intensity at that point is given as, (‡ 'i_b = 4i_ocos ^ 2}} {{2}} right) (‡' i_b = 4i_ocos ^ 2 left (FRAC { Daily Exam Live MasterClasses Practice Question Bank Mock Tests & Quizzes Get Started For Free Download App Trusted by 2,17,86,130+ students Î »(Frac {1} {3} Coherent added waves: the phenomenon in which two or more waves To form a resulting wave of greater, lower or the same amplitude is called interference. The interference is based on the principle of overlap, based on which in a particular point of the vehicle, the "resulting shift produced by a number of waves is the sum of the displacement carrier produced by each of the waves. Let two sources. of waveÃ ¢ and s2 are consistent. Let the intensity of the waves is Me. For constructive interference: if at any point the waves that emerge from consistent S1 and S2 sources are in phaseÃ ¢, then we will have constructive interference and the resulting intensity It will be. and s2 are in the opposite stage, then we will have destructive interference and the resulting intensity will be zero. Ã, Ã, Ã, â «The difference of the path = (N + Frac {1} {2}) "En = 0,1,2,3, ... where â €" Ãžâ "= Calculation of the wavelength: for destructive interference: if I do We point the waves that emerge from consistent sources S1 and S2 are in the opposite stage then, we will have destructive interference and the resulting intensity will be zero. Ã, Ã, Ã, Ã, ã, 'path difference = (left (n + frac {1} {2}) \ b) . Whereâ € »Ãž Â» = wavelength in the data The case the resulting intensity is zero, so there will be destructive interference. For destructive interference, the possible differences in the route between the waves are provided as, for n = 0, Ã, "path difference = 0.5" for n = 1, Ã, â € ¡"the difference of path = 1.5 "for n = 2, Ã, Ã, Ã, Â« The difference of the path = 2.5 "Â» Therefore it is clear that when the difference of the route is "Â" and ({ÃžÂ »} {3}), there will be no destructive interference. Destructive interference will occur when the difference of the path between the waves is 2.5 Â" .â €. "Then, option 3 is correct. The Learning Platform of India starts the complete learning platform Preparation of the complete exam daily live masterclasses Practice Question Question Banca Banca Tests & Quiz has started for the free download of the trusted app of 2.17.86.130 students students