



PHYSICS

BOOKS - MODERN PUBLICATION

Huygen's Principle

EXAMPLE

1. What is ether medium?



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2. What is wavefront ? State its relation with ray of light.



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3. Define wavefront and a ray.



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4. What do you understand by a wavefront?



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5. Define a ray.



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6. What is a ray of light?



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7. Differentiate between a ray and a wavefront.



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8. What type of wavefront will emerge from a point source?



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9. The shape of wave front emitted by a light source in the form of a narrow slit is



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10. What type of wavefront will emerge from a point source?



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11. Name different types of wavefront.



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12. What is the shape of the wavefront in each of the following cases: Light diverging from a

point source.



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13. What is the shape of the wavefront in each of the following cases: Light emerging out of a convex lens when a point source is placed at its focus.



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14. What is the shape of the wavefront in each of the following cases: The portion of the wavefront of light from a distant star intercepted by the Earth.



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15. Sketch the wavefronts corresponding to converging rays.



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16. For light diverging from a point source.



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17. Sketch the wavefronts corresponding to diverging rays.



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18. How is a wavefront related to the direction of corresponding rays?





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19. What is the phase difference between any two points on a wavefront?



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20. When a wave is reflected from a denser medium, the change in phase is:



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21. When light undergoes refraction, what happens to its frequency?



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22. Can the phenomenon of rectilinear propagation, reflection and refraction be explained on the basis of wave nature of light?



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23. What are the drawbacks of wave theory of light?



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24. In what respect is Huygens' wave theory of light similar to Maxwell's electromagnetic theory? In what respect are the two theories different?



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25. Why ether was called a hypothetical medium?



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26. What type of wavefront will emerge from a point source?



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27. What is the shape of wave front originating from a point source



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28. What is the shape of wavefront originating from
a line source?



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29. What is meant by a wavefront? What is the shape of the wavefront of a beam of parallel rays?



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30. Is the speed of light in glass independent of the colour of light? If not, which of the two colours red and violet travels slower in a glass prism?



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31. When monochromatic light is incident on a surface separating two media, the reflected and refracted light both have the same frequency as the incident frequency. Explain, why.



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32. When light travels from a rarer to denser medium, the speed decreases. Does the decrease in speed imply a decrease in the

energy carried by the light wave? Justify your answer.



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33. What is the shape of the wavefront in each of the following cases: Light emerging out of a convex lens when a point source is placed at its focus.



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34. Explain how a parallel beam of light on reflection from a concave mirror gets converged.



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35. A plane wavefront is incident on a prism. Draw the shape of the refracted wavefront.



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36. Draw a diagram to show the refraction of a plane wavefront incident on a convex lens and hence draw the refracted wavefront.



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37. In the wave picture of light, intensity of light is determined by square of the amplitude of wave. What determines the intensity of light in the photon picture of light.



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38. Why is the contribution of the wavelets lying on back of secondary wavefront zero?



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39. Explain how a parallel beam of light on reflection from a concave mirror gets converged.



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40. Explain how a parallel beam of light on reflection from a convex mirror gets diverged.



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41. Explain how a ray of light passing through a prism is deviated towards the base of the prism.



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42. Explain how a parallel beam of light on refraction from a convex lens gets converged.



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43. Explain how a parallel beam of light on refraction through a concave lens gets diverged.



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1. What is Huygen's principle?



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2. Explain the term wavefront. Describe Huygens' construction for propagation of wavefronts in a medium.



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3. With the help of a diagram, explain the Huygens' principle for the propagation of light in a medium.



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4. State and explain Huygen's principle.



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5. What are the two assumptions on which Huygens' principle is based? Explain Huygen's geometrical construction for the wavefronts.



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6. State the postulates of Huygens' wave theory.



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7. What is the shape of wavefront originating from a line source?



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8. For light diverging from a point source.



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9. State Huygen's principle of propagation of light and prove the laws (Snell's law) of refraction on its basis.



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10. State Hugen's principle and verify the laws of reflection of light using this principle.



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11. State Hugen's principle and verify the laws of reflection of light using this principle.



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12. Using Huygens theory, verify the law of reflection?



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13. Verify the laws of reflection using Huygen's wave principle.



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14. Using Huygens' principle and drawing the sketches of wavefront, show how a parallel beam of light is reflected from a polished surface and hence verify that $\angle i = \angle r$.



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15. Define wavefront and a ray.



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16. Verify the laws of reflection using Huygen's wave principle.



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17. State Hugen's principle and verify the laws of reflection of light using this principle.





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18. Describe the phenomenon of refraction from Huygens' wave theory.



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24. State Huygen's principle of propagation of light and prove the laws (Snell's law) of refraction on its basis.



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25. How is a wavefront defined? Using Huygens' principle draw a figure showing the propagation of a plane wave refracting at a plane surface separating two media. Hence verify Snell's law of refraction.



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26. Using Huygen's principle and drawing the sketches of wavefronts, show how a parallel beam of light is refracted from the surface of separation of a rarer medium to a denser medium. Verify Snell's law.



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27. State Huygen's principle of propagation of light and prove the laws (Snell's law) of

refraction on its basis.



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28. State the principle, which helps us to determine the shape of the wavefront at a later time from its given shape at any time. Apply this principle to

Show that a spherical/plane wavefront continues to propagate forward as a spherical/plane wave front.



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29. State the principle, which helps us to determine the shape of the wavefront at a later time from its given shape at any time. Apply this principle to

Derive Snell's law of refraction by drawing the refracted wavefront corresponding to a plane wavefront incident on the boundary separating a rarer medium from a denser medium.



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30. Explain the action of a prism, a convex lens and a concave mirror, when a plane wavefront is incident on it.



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31. State Huygens' principle and use it to describe the process of reflection of a parallel beam of light incident on a plane mirror obliquely with the help of a labelled diagram. Prove that the angle of incidence is equal to the angle of reflection.



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32. How is a wavefront defined? Using Huygens' principle draw a figure showing the propagation of a plane wave refracting at a plane surface separating two media. Hence verify Snell's law of refraction.



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33. How is a wavefront defined? Using Huygens' principle draw a figure showing the propagation of a plane wave refracting at a plane surface separating two media. Hence verify Snell's law of refraction.



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34. What is the shape of wave front originating from a point source



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35. Using Huygens' principle and drawing the sketches of wavefront, show how a parallel beam of light is reflected from a polished surface and hence verify that $\angle i = \angle r$.



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36. How is a wavefront defined? Using Huygens' principle draw a figure showing the propagation of a plane wave reflecting at the interface of the two media. Show that the

angle of incidence is equal to the angle of reflection.



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37. State Huygen's principle of propagation of light and prove the laws (Snell's law) of refraction on its basis.



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39. How is a wavefront defined? Using Huygens' principle draw a figure showing the propagation of a plane wave refracting at a plane surface separating two media. Hence verify Snell's law of refraction.





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43. What is the shape of the wavefront in each of the following cases: Light emerging out of a convex lens when a point source is placed at its focus.



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44. Verify the laws of reflection using Huygen's wave principle.



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45. State Huygen's principle of propagation of light and prove the laws (Snell's law) of refraction on its basis.



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