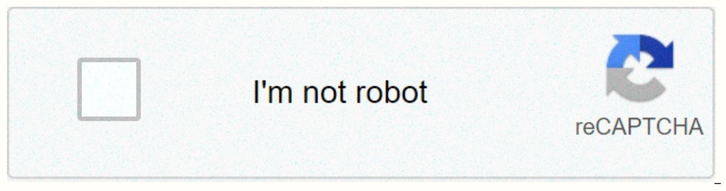


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# Electric and magnetic field vectors conceptual question masteringphysics

INTRO: Figure 1 Figure 2 Figure 4 Figure 3 all questions will refer to the following answer choice: a) +xb) –xc) +yd) –ye) +zf) –zg) at +45° angle at xyplanetPart C:The electric and magnetic field vectors at a specific point in space and time illustrate. (Figure 1) Based on this information, in what direction does the electromagnetic wave spread? SOLUTION:the Poynting Vector S points in the direction of E×Bwhich in this instance would point in positive z direction, or option e)~ thumb is E, pointer is B → middle finger points +zDel B:The electrical and magnetic field vectors at a certain point in time and space are illustrated. (Figure 2) (E and B are in the xy plane. Both vectors make 45 angles with the +y axis.) Based on this information, in what direction does the electromagnetic wave spread? SOLUTION:Since E&B is both in the xyplane, their cross-product will be along the z-axisIn this case, E×B points in negative z× direction, or option f)~thumb is E, the pointer is B, intermediate points -zDel C:Magnetic field vector and the direction of distribution of an electromagnetic wave is illustrated. (Figure 3) Based on this information, in what direction does the electric field vector point? WORKAROUND:I basically just work backwards ~ the middle is v, pointer is B, thumb points + y → option c)Part D: The electric field vector and the direction of propagation of an electromagnetic wave are illustrated. (Figure 4) (E is in XZ planes and makes a 45° angle with the +x axis.) Based on this information, in what direction does the magnetic field vector point? SOLUTION: work backwards again but pay attention to angles ~ thumb is E, the middle is v, points of 45 ° between +x & -z, or option g) Academia.edu use cookies to customize content, customize ads and improve the user experience. By using our site, you agree to our collection of information through the use of cookies. To learn more, please view our Privacy Policy.× 3/22/2019Homework #13 (phy 112) Homework #13 (phy 112) Due: 11:00 am on Friday, 29 March 2019 To understand how points are awarded, read the Grade Statement for this assignment. Electrical and magnetic field vectors Conceptual question part A The electrical and magnetic field vectors at a certain point in time and space are illustrated. Based on this information, in what direction does the electromagnetic wave spread? Clue 1. Right rule for electromagnetic wave speedIn an electromagnetic wave, the electrical and magnetic field vectors are perpendicular to each other. The scale propagates in a direction perpendicular to both field vectors. Because the two field vectors define a two-dimensional plane, there are two distinct directions that are perpendicular to the plane. The right-hand rule specifies in which of these directions the wave travels. To use the right rule, do the following:1. Point your fingers on your right hand in the direction of the electric field vector.2. Rotate your hand until you can curl your fingers in the direction of the magnetic field vector. The direction of your thumb is then the direction of the speed of the electromagnetic wave. If the electrical and magnetic field vectors at a specific point in time and space are as shown below, applying the right rule should result in the thumb pointing downwards, in the - y direction. Therefore, the speed of the electromagnetic wave is in – y direction. ANSWER: 3/22/2019Home work #13 (phy 112) CorrectPart B The electrical and magnetic field vectors at a specific point in time and space are illustrated. (and is in the xy plane. Both vectors make 45 angles with the y-axis.) Based on this information, in what direction does the electromagnetic wave propagate? ANSWER: CorrectPart C The magnetic field vector and the propagation direction of an electromagnetic wave are illustrated. Based on this information, in what direction the denelectric field vector point?+ x - x + y – y + z – z at a +45 angle in xy planet - E’. B’. - x - x + y + y + z – z at a -4 5 angle in xyplanet - 3/22/2019Homework #13 (phy 112) Hint 1. Working backwards with the right ruleSince the speed of the scale is given, the orientation of your right thumb is known. Place your right thumb along the + x axis to inform the youth of the electric field the vector must be in yz planet. Since the electric field must also be perpendicular to the magnetic field, and be curlable intothe magnetic field, only one option remains for the alignment of the electric field vector. ANSWER: CorrectPart D The electric field vector and the propagation direction of an electromagnetic wave are illustrated. (is in XZ plane and makes a 45 angle with the x-axis.) Based on this information, in what direction does the magnetic field vector point? Clue 1. Working backwards with the right ruleSince the speed of the scale is given, the orientation of your right thumb is known. Place your right thumb along the + z axis should inform the youth on the magnetic field the vector must be in the xz plane. With your fingers in the direction of the electric field, there is only one orientation of the magnetic field that your fingers can curl in.+ x – x + y – y + z – z in a +45 angle in the xz plane .