NCERT ANALOG 11.15. Q20

EE23BTECH11214 - Harsha Vardhan Kumar

Question: A travelling harmonic wave on a string is described by

$$y(x,t) = 7.5\sin(0.0050x + 12t + \frac{\pi}{4})$$

(a) What are the displacement and velocity of oscillation of a point at $x = 1\,\text{cm}$ and $t = 1\,\text{s}$? Is this velocity equal to the velocity of wave propagation?

(b) Locate the points on the string which have the same transverse displacements and velocity as the point at $x = 1\,\text{cm}$ at $t = 2\,\text{s}$, $t = 5\,\text{s}$, and $t = 11\,\text{s}$.