

Prayas JEE (2025)

Physics

Waves

DPP: 1

Q1 The equation of a progressive wave for a wire is:

$$y = 4 \sin \left[\frac{\pi}{2} \left(8t - \frac{x}{4} \right) \right]$$

If x and y are measured in cm then velocity of wave is:

- (A) 64 cm/s along $-x$ direction
- (B) 32 cm/s along $-x$ direction
- (C) 32 cm/s along $+x$ direction
- (D) 64 cm/s along $+x$ direction

Q2 Due to propagation of longitudinal wave in a medium, the following quantities also propagate in the same direction:

- (A) Energy, Momentum and Mass
- (B) Energy
- (C) Energy and Mass
- (D) Energy and Linear Momentum

Q3 A travelling wave pulse is given by

$$y = \frac{20}{4 + (x + 4t)^2} \text{ (m)}, \text{ then}$$

- (A) The pulse is travelling along negative x axis
- (B) The speed of pulse is 4 m/s
- (C) The amplitude of pulse is 5 m
- (D) All of these

Q4 The equation of a wave pulse is given as

$$y = \frac{A}{4 + (2t + 0.5x)}, \text{ where } t \text{ is in seconds and } x$$

in metres. The speed of the pulse is

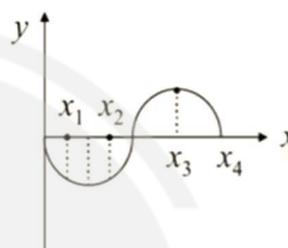
- (A) 8 m/s
- (B) 4 m/s
- (C) 2 m/s
- (D) 0.5 m/s

Q5 Equation of a wave is given by

$$y = 0.4 \sin(314t - 3.14x), \text{ where } x \text{ and } y \text{ in metre and time } t \text{ is in second. Velocity of the wave is 100 m/s along}$$

- (A) Positive x axis
- (B) Negative x axis
- (C) Positive y axis
- (D) Negative y axis

Q6 $y - x$ graph of a travelling wave along $+x$ direction is shown at any instant t . (Symbols have their usual meanings). Velocity of particle at



- (A) x_1 is downward
- (B) x_2 is downward
- (C) x_3 is upward
- (D) x_4 is downward

Q7 The displacement y of a wave travelling in the x - direction is given by

$$y = 5 \cos \left(300t - 1.5x + \frac{\pi}{4} \right) \text{ metre}$$

where x is in metre and t in seconds. The speed of the wave motion is

- (A) 200 m/s
- (B) 300 m/s
- (C) 450 m/s
- (D) 600 m/s

Q8 The equation of a wave is given by $Y = 5 \sin 10\pi(t - 0.01x)$ along the x -axis. (All the quantities are expressed in SI units). The phase difference between the points separated by a distance of 10 m along x -axis is

- (A) $\frac{\pi}{2}$
- (B) π
- (C) 2π
- (D) $\frac{\pi}{4}$


[Android App](#)
[iOS App](#)
[PW Website](#)

- Q9** The displacement function of a wave travelling along positive x -direction is $y = \frac{1}{2+3x^2}$ at $t = 0$ and by $y = \frac{1}{2+3(x-2)^2}$ at $t = 2$ s, where y and x are in metre. The velocity of the wave is
- (A) 2 m/s
(B) 0.5 m/s
(C) 1 m/s
(D) 3 m/s
- Q10** Which of the following is correct regarding the progressive wave $y = 10 \sin 2\pi \left(\frac{x}{8} + \frac{t}{4} \right)$, (where x is in metre and t in second)?
- (A) Angular frequency is 2π and propagation constant is π
(B) Frequency is 4 Hz and wavelength is 8 metre
(C) Amplitude is 10 metre and wavelength is $\frac{1}{8}$ metre
(D) Wavelength is 8 metre and frequency is $\frac{1}{4}$ Hz

[Android App](#)[iOS App](#)[PW Website](#)

Answer Key

Q1 (C)

Q2 (D)

Q3 (D)

Q4 (B)

Q5 (A)

Q6 (B)

Q7 (A)

Q8 (B)

Q9 (C)

Q10 (D)



[Android App](#)

| [iOS App](#)

| [PW Website](#)