KEY

1. A transverse wave traveling on a string is described by the expression
$y(x,t) = 1$ cm sin $(1.3 \, x \,/m - 10 \, t \,/ s)$, where m=meters, cm=centimeters,
and s=seconds . What is the frequency, f, of this wave?

A	20 Hz	F	1.6 Hz
B	1.3 Hz	(G)	1.59 Hz
C	10 Hz	H	20 Hz
D	628 Hz	I	0.314 Hz
E	12 Hz	J	314 Hz

$$\frac{10}{s} \not{t} = 2\pi f \not{t}$$
$$\Rightarrow f = \frac{10}{2\pi} \frac{1}{s} \approx \boxed{1.59 \, H_z}$$

2. For the wave in problem 1, what is the period, T, of the wave?

A	0.1 s	F	0.159 s
B	10 s	G	7.69 s
C	0.0318 s	H	76.9 s
D	0.769 s	(I)	0.628 s
E	31.4 s	J	1 s

$$T = \frac{1}{f} = \frac{2\pi}{10} \, s$$
$$\approx \boxed{0.628 \, s}$$

3. For the wave in problem 1, what is the wavelength, λ, of the wave?

A	1.3 m	F	3.2 mm
B	2.42 m	G	0.13 m
C	13 m	H	13 mm
D	0.769 m	(I)	4.83 m
E	7.69 m	J	8.17 m

$$\frac{2\pi}{\lambda} \not{x} = \frac{1.3 \not{x}}{m}$$
$$\Rightarrow \lambda = 2\pi \frac{m}{1.3}$$
$$\approx \boxed{4.83 \, m}$$

4. For the wave in problem 1, what is the direction the wave is traveling?

A	- x direction	F	- z direction
(B)	+x direction	G	it's not moving
C	up	H	cannot be determined
D	+ y direction	I	- y direction
E	+ z direction	J	down

5. For the wave in problem 1, what is the transverse acceleration of the
wave at time t=0 and position x=1m?

A	0.26 m/s²	F	0.1 m/s²
B	- 10 m/s²	G	9.87 m/s²
C	100 m/s²	H	98.7 m/s²
D	- 3.14 m/s²	I	0.0987m/s²
E	3.14 m/s²	(J)	- 0.963 m/s²

$$y = A \sin (kx - \omega t)$$
$$\frac{\partial^2 y}{\partial t^2} = -\omega^2 A \sin (kx - \omega t)$$
$$\frac{\partial^2 y}{\partial t^2}(1m, 0) = -\omega^2 A \sin kx$$
$$= -\left(\frac{10}{s}\right)^2 (1cm) \sin(1.3) = \frac{100 cm}{s^2} \sin(1.3)$$
$$\cong -1 \, m/s^2 \, \sin(1.3) \cong \boxed{-0.964 \, m/s^2}$$

That's the closest
Answer.

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