(1) Two waves are described as follows:

$$y1(x,t) = 4\ (x - v*t)$$

$$y2(x,t) = 4\ (x + v*t)$$

At what position and time do these two waves cancel?

A1 At x = 0 and at any time t.
A2 At x = 0 and at t = 0 only.
A3 They never cancel (they always add up).
A4 At t = 0 and at any position x.
A5 They always cancel because v has opposite signs.

(2) A sinusoidal wave is described as:

$$y = (0.1\ m) * \sin[10*pi*(x/5 + t - 3/2)],$$

where x is in meters and t is in seconds.
What are the values of its frequency (f), and its velocity (v)?

A1 f=5 Hz, v = 5 m/s moving in -x-direction.
A2 f=5 Hz, v = 5 m/s moving in +x-direction.
A3 f=2 Hz, v = 1 m/s moving in -x-direction.
A4 f=2 Hz, v = 1 m/s moving in +x-direction.
A5 f=2 Hz, v = 5 m/s moving in -x-direction.

(3) A transverse harmonic wave in a string is described by:

y(x,t) = (3.0 m) * sin(0.3 x - 8 t - phi),

where x is in meters and t is in seconds.
At t = 0 and x = 0, a point on the string has a positive displacement and has velocity of 0.
The phase constant (phi) is:

A1 270 degrees.
A2 180 degrees.
A3 135 degrees.
A4 90 degrees.
A5 45 degrees.

(4) The power transmitted by a sinusoidal wave on a string does not depend on:

A1 the length of the string.
A2 the frequency of the wave.
A3 the wavelength of the wave.
A4 the tension in the string.
A5 the amplitude of the wave.

(5) A 100-Hz oscillator is used to generate a sinusoidal wave, on a string, of wavelength 10 cm. When the tension in the string is doubled, the oscillator produces a wave with a frequency and wavelength of :

A1 100 Hz and 14 cm.
A2 200 Hz and 20 cm.
A3 200 Hz and 14 cm .
A4 100 Hz and 20 cm.
A5 50 Hz and 14 cm.

(6) The lowest resonant frequency, in a certain string clamped at both ends, is 50 Hz. When the string is clamped at its midpoint, the lowest resonant frequency is:

A1 100 Hz.
A2 150 Hz.
A3 200 Hz.
A4 250 Hz.
A5 50 Hz.

(7) The equation for a standing wave is given by :

y = 4.00*10**(-3) sin(2.09 x) cos(60.0 t)

(in SI units) .

What is the distance between two consecutive antinodes?

A1 1.50 m.
A2 0.56 m.
A3 2.20 m.
A4 5.00 m.
A5 3.00 m.