

NAME _____
STUDENT No. _____
SECTION No. _____

STUDENT NUMBER	1	2	3	4	5	6	7	8	9	0	A	B	C	D	E
SECTION NUMBER	1	2	3	4	5	6	7	8	9	0	A	B	C	D	E
TEST CODE No.	1	2	3	4	5	6	7	8	9	0	A	B	C	D	E

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|---------------|----------------|----------------|----------------|-----------------|
| 1 (A B C D E) | 26 (A B C D E) | 51 (A B C D E) | 76 (A B C D E) | 101 (A B C D E) |
| 2 (A B C D E) | 27 (A B C D E) | 52 (A B C D E) | 77 (A B C D E) | 102 (A B C D E) |
| 3 (A B C D E) | 28 (A B C D E) | 53 (A B C D E) | 78 (A B C D E) | 103 (A B C D E) |

Q1. The transverse displacement of a wave on a string is
 $y(x, t) = 0.0241 \sin(3.53x - 157t)$,
 where x and y are in meters and t is in seconds. Calculate the magnitude of the transverse velocity, in the units of m/s, at $x = 3.94$ m and $t = 1.26$ s.

A) 1.71
B) 3.05
C) 3.38
D) 3.75
E) 0.485

$$u = -\omega y \cos(kx - \omega t)$$

$$= -0.0241(157) \cos(3.53(3.94) - 157(1.26))$$

$$= -0.485 \text{ m/s}$$

Q2. A sinusoidal wave of frequency 472 Hz has a speed of 330 m/s. How many meters apart are two points that differ in phase by 4.04 radians?

A) 5.78
B) 2.82
C) 0.920
D) 0.450
E) 5.20

$$\Delta\phi = k\Delta x = \frac{2\pi}{\lambda} \Delta x$$

$$\Rightarrow \Delta x = \frac{\lambda}{2\pi} \Delta\phi = \frac{v}{2\pi f} \Delta\phi = \frac{330}{2\pi(472)} 4.04$$

$$= 0.450 \text{ m}$$

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|----------------|----------------|----------------|-----------------|-----------------|
| 23 (A B C D E) | 48 (A B C D E) | 73 (A B C D E) | 98 (A B C D E) | 123 (A B C D E) |
| 24 (A B C D E) | 49 (A B C D E) | 74 (A B C D E) | 99 (A B C D E) | 124 (A B C D E) |
| 25 (A B C D E) | 50 (A B C D E) | 75 (A B C D E) | 100 (A B C D E) | 125 (A B C D E) |