Astronomy Ranking Task:
Doppler Shift

Exercise #4

Description: An important line in the absorption spectrum of stars occurs at a wavelength of 656 nm for stars at rest. Imagine that you study five stars (A–E) from Earth and discover that this absorption line is observed at the wavelength shown in the table below for each of the five stars.

<table>
<thead>
<tr>
<th>STAR</th>
<th>Observed Wavelength of Absorption line</th>
</tr>
</thead>
<tbody>
<tr>
<td>A</td>
<td>650 nm</td>
</tr>
<tr>
<td>B</td>
<td>663 nm</td>
</tr>
<tr>
<td>C</td>
<td>656 nm</td>
</tr>
<tr>
<td>D</td>
<td>657 nm</td>
</tr>
<tr>
<td>E</td>
<td>646 nm</td>
</tr>
</tbody>
</table>

A. Ranking instructions: Rank the size of the Doppler shift (from largest to smallest) observed tonight for the light from each star (A–E).

Ranking Order: Largest 1 ____ 2 ____ 3 ____ 4 _____ 5 _____ Smallest

Or, the Doppler shift of the light from the stars would all be the same. _____ (indicate with a check mark)

Carefully explain your reasoning for ranking this way:
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

B. Ranking instructions: As observed tonight, rank the speed of the stars (A–E) from moving fastest toward the Earth, through not moving at all, to moving fastest away from Earth.

Ranking Order:

Moving fastest toward 1 ____ 2 ____ 3 ____ 4 _____ 5 _____ Moving fastest away

Or, all the stars would have the same speed _____ (indicate with a check mark)

Carefully explain your reasoning for ranking this way:
____________________________________________________________________
____________________________________________________________________
____________________________________________________________________

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