F1-CT02: ULTRAVIOLET LIGHT ON METAL DISCS—WORK FUNCTION
A beam of ultraviolet light shines on a metal disc, causing electrons to be emitted from the disc. The two cases are identical, except that the metals are different and the emitted electrons have a higher maximum speed in Case A than in Case B.

Is the work function of the metal (i) greater in Case A, (ii) greater in Case B, or (iii) the same in both cases?______

Explain your reasoning.______

F1-SCT04: PHOTOELECTRIC EFFECT INVESTIGATIONS—MORE ELECTRONS
In two experiments, electromagnetic waves are used to eject electrons from a metal. The electromagnetic waves have a longer wavelength in experiment A than in experiment B. More electrons were ejected from metal B than from metal A. Three students are discussing the experiments:

Arturo: “Since more electrons were ejected from metal B, that means the intensity of the light used in that investigation was higher.”

Bonifacio: “I don’t think we can say that for sure. Since the wavelength used in B was shorter, those waves would have more energy, and they could eject more electrons even though the intensity of the wave was lower.”

Carla: “I think that all we can conclude is that the work function for metal B is smaller than the work function of metal A, and that is why more electrons were ejected from B.”

With which, if any, of these students do you agree? Arturo ______ Bonifacio ______ Carla ______ None of them ______

Explain your reasoning.______

F1-RT06: ULTRAVIOLET LIGHT INCIDENT ON NICKEL—EJECTED ELECTRON SPEED
A nickel disc emits electrons when it is illuminated with a beam of ultraviolet light. The frequency of the light and the intensity of the light beam are given for each case.

<table>
<thead>
<tr>
<th>Case A</th>
<th>Case B</th>
<th>Case C</th>
<th>Case D</th>
</tr>
</thead>
<tbody>
<tr>
<td>Ultraviolet light</td>
<td>Ultraviolet light</td>
<td>Ultraviolet light</td>
<td>Ultraviolet light</td>
</tr>
<tr>
<td>$f = 1.8 \times 10^7 \text{ Hz}$</td>
<td>$f = 2.6 \times 10^7 \text{ Hz}$</td>
<td>$f = 1.8 \times 10^7 \text{ Hz}$</td>
<td>$f = 2.6 \times 10^7 \text{ Hz}$</td>
</tr>
<tr>
<td>$1 - 40 \text{ W/m}^2$</td>
<td>$1 - 40 \text{ W/m}^2$</td>
<td>$1 - 60 \text{ W/m}^2$</td>
<td>$1 - 80 \text{ W/m}^2$</td>
</tr>
</tbody>
</table>

Nickel disc

Rank the maximum speed of the electrons ejected from nickel.

1 Greatest, 2, 3, 4 Least, All the same, All zero, Cannot determine

Explain your reasoning.______