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| --- | --- |
| yildiz teknik amblem ile ilgili görsel sonucu | **YILDIZ TECHNICAL UNIVERSITY**  **DEPARTMENT OF BIOMEDICAL ENGINEERING**  **BME3402- MEDICAL INSTRUMENTATION LABORATORY** |

**EXPERIMENT 6 – ELECTROOCULOGRAM (EOG)**

**DATA AND CALCULATIONS**

* **Pendulum Tracking**

**Table 1**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cycle** | **Pendulum** | | **Simulation** | |
| **(sec)** | **(mv)** | **(sec)** | **(mv)** |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| 4 |  |  |  |  |
| 5 |  |  |  |  |
| 6 |  |  |  |  |
| 7 |  |  |  |  |
| 8 |  |  |  |  |
| 9 |  |  |  |  |
| 10 |  |  |  |  |

* **Vertical Tracking**

**Table 2**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Cycle** | **Real Object** | | **Simulation** | |
| **(sec)** | **(mv)** | **(sec)** | **(mv)** |
| 1 |  |  |  |  |
| 2 |  |  |  |  |
| 3 |  |  |  |  |
| 4 |  |  |  |  |
| 5 |  |  |  |  |

* **Saccades**

**Table 3**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Measurement** | ***Read Silently 1***  ***1st line 2nd line*** | | ***Read Silently 2***  ***1st line 2nd line*** | | ***Read Aloud***  ***1st line 2nd line*** | |
| **Number of words** |  |  |  |  |  |  |
| **Number of saccades** |  |  |  |  |  |  |
| **Time interval between saccades (sec)**  **#1** |  |  |  |  |  |  |
| **#2** |  |  |  |  |  |  |
| **#3** |  |  |  |  |  |  |
| **#4** |  |  |  |  |  |  |
| **#5** |  |  |  |  |  |  |
| **#6** |  |  |  |  |  |  |
| **#7** |  |  |  |  |  |  |
| **#8** |  |  |  |  |  |  |
| **#9** |  |  |  |  |  |  |
| **Average time interval between saccades (sec)** |  |  |  |  |  |  |

* **Questions**

1. Focusing a camera changes the distance between the lens and the film. Does the eye focus by changing the distance between the lens and the retina? Explain your answer.
2. Define the following terms:
3. Cone
4. Rod
5. Visual Field
6. Visual Fixation
7. Saccade / Microsaccade
8. Why is vision in darkness more effective when focusing away from the fovea rather than focusing directly on the fovea?
9. Explain the difference between “voluntary fixation” and “involuntary fixation”:
10. Examine the data in Table 1 and answer the following questions:
11. Did the amplitude continue to decrease with each successive swing cycle during pendulum tracking? Explain.
12. Did the amplitude continue to decrease with each successive swing cycle during simulated pendulum tracking? Explain.
13. Did the time interval (period) of each successive swing cycle increase, decrease, or remain constant during pendulum movement? Explain.
14. Did the time interval (period) of each successive swing cycle increase, decrease, or remain constant during simulated movement? Explain.
15. Are the waveform shapes different between tracking and simulated tracking data? Explain.
16. Examine the data in Table 2 and answer the following questions:
17. Do the cycle amplitudes increase, decrease, or remain constant during vertical tracking? Explain.
18. Do the cycle amplitudes increase, decrease, or remain constant during simulated vertical tracking? Explain.
19. Do the cycle periods increase, decrease, or remain constant during vertical tracking? Explain.
20. Do the cycle periods increase, decrease, or remain constant during simulated vertical tracking? Explain.
21. Are the waveform shapes different between vertical tracking and simulated vertical tracking data? Explain.
22. Examine the data in Table 3 and answer the following questions:
    1. Did the number of saccades match the number of words for each line? Explain any differences.
    2. Is the average time interval between saccades different when reading an easy passage vs. a challenging passage? Explain.
    3. Is the average time interval between saccades different when reading the same passage silently vs. aloud?
    4. Are the waveform shapes different between Read Silently 2 and Read Aloud data? Explain.
23. Define corneal–retinal potential (CRP) and explain its relation to electrooculography and the Electrooculogram