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

**EXP-3 ELECTROCARDIOGRAPHY (ECG-2)**

1. **Einthoven’s Law—Simulated Confirmation: Lead I + Lead III = Lead II**

##### **Table 1 Supine**

|  |  |  |  |
| --- | --- | --- | --- |
| **Lead** | ***Same Single Cardiac Cycle*** | **mV\*** | \*Include the polarity (+ or -) of the Delta result since R-waves may be inverted on some of the leads.  |
| Lead I |  |  |
| Lead III |  |  |
| Lead II |  |  |

1. **Mean Electrical Axis of the Ventricles (QRS Axis) and Mean Ventricular Potential—Graphical Estimate**

**Table 2**

|  |  |
| --- | --- |
| **CONDITION** |  |
| Lead I  | Lead III  |
|  Supine (Recording 1) |  |  |
|  Seated |  |  |
|  Start of inhale |  |  |
|  Start of exhale |  |  |

Create two plots on each of the following graphs, using data from Table 2 Use a different color pencil or pen for each plot.

**Graph 1: *Supine and Seated***



From the above graph, find the following values:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Condition** |  | **Mean Ventricular Potential** |  | **Mean Ventricular (QRS) Axis** |
| Supine |  |  |  |  |
| Seated |  |  |  |  |

**Graph 2: *Inhale /Exhale***



From the above graph, find the following values:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Condition** |  | **Mean Ventricular Potential** |  | **Mean Ventricular (QRS) Axis** |
| Start of inhale |  |  |  |  |
| Start of exhale |  |  |  |  |

1. **Mean Electrical Axis of the Ventricles (QRS Axis) and Mean Ventricular Potential—More Accurate Approximation**

Use Table 3 to add the Q, R, and S potentials to obtain net potentials for Recording 1—Supine.

 **Table 3**

|  |  |
| --- | --- |
| **POTENTIAL** |  |
| Lead I  | Lead III  |
|  Q |  |  |
|  R |  |  |
|  S |  |  |
|  QRS Net |  |  |

**Graph 3: *Supine***



From the above graph, find the following values:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **Condition** |  | **Mean Ventricular Potential** |  | **Mean Ventricular (QRS) Axis** |
| Supine |  |  |  |  |

**Questions**

1. Define **ECG** ?
2. Define **Einthoven’s Law**.
3. Define **Einthoven’s Triangle** and give an example of its application.
4. What normal factors effect a change the orientation of the **Mean Ventricular (QRS) Axis**?
5. Define **Left Axis Deviation (LAD)** and its causes.
6. Define **Right Axis Deviation (RAD)** and its causes.
7. What factors affect the amplitude of the R wave recorded on the different leads?