Formation Temperature

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Branch: Petroleum **Section/Group: 02**
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Subject Name: Formation Evaluation lab **Subject Code: PEP-318**

1. Aim/Overview of the practical:

Determination of Formation Temperature (Tf) with depth.

2. Task to be done:

To determine Formation Temperature (Tf) with depth (linear gradient assumed).

3. Apparatus:

- Logging data
- Code editor or IDE

4. Algorithm/Flowchart:

- Develop a script, with relevant inputs, for designing the relevant formulation.
- Execute the program and display in the console.

5. Theme/Interests definition:

Geothermal gradient: Is the amount of increase in temperature with respect to depth.

6. Steps for experiment/practical:

- Locate BHT (200°F) on the 80 scale (bottom of the chart).
- Follow BHT (200°F) vertically up until it intersects the 10,000 ft (TD) line. This intersection defines the temperature gradient.
- Move parallel to the (diagonal) temperature gradient line up to 7000 ft (formation depth).
- Formation temperature (164°F) is read on the bottom scale (i.e., 80 scale) vertically down from the point where the 7000 ft line intersects the temperature gradient.

7. Observations/Discussions:

- Surface temperature = 80°F
- Bottom hole temperature (BHT) = 200°F
- Total depth (TD) = 10,000 ft
- Formation depth = 7000 feet

8. Percentage error (if any or applicable**):**

NA

9. Calculations/ Chemical Reactions / Theorems /Formulas used etc:

$$\boldsymbol{Goethermal\ gradient} = (BHT - surface\ temp) / total\ depth$$

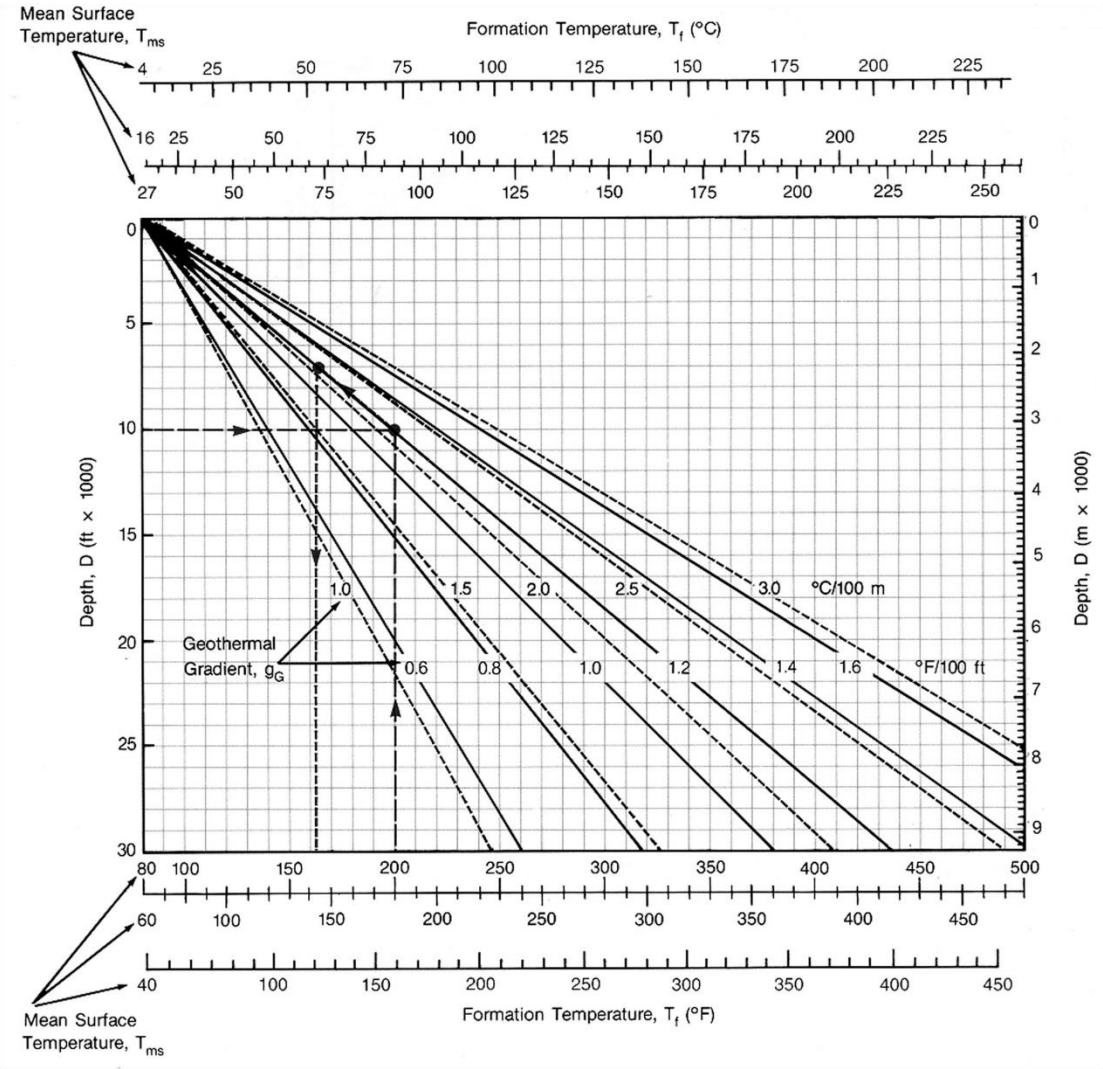
$$\boldsymbol{Formation\ temp} = (geothermal\ gradient \times formation\ depth) + surface\ temp$$

$$\boldsymbol{Formation\ temp} = (0.012 \times 7000) + 80 = \mathbf{164}$$

10. Result/Output/Writing Summary:

The formation temperature was found to be **164 °F**.

11. Graphs (If Any):



12. <u>Learning outcomes</u> (What I have learned**):**

- The formation temperature can be determined using the temperature vs depth plot.
- The formation temperature can be calculated using the appropriate equation.
- While calculating the formation temperature, a linear gradient is assumed depending of the zone area.
- Able to implement formation temperature calculation, by developing a script, with relevant inputs.
- Learned how to perform the experiment.