Assignment 4

The due date for submitting this assignment has passed. As per our records you have not submitted this assignment.

Due on 2018-09-12, 23:59 IST.

1) From a rolled polycrystalline microstructure, the $P_L(\theta)$ values (in arbitrary units) for several observations taken by a varying direction linear probe is given below (\theta is measured in degrees from rolling direction) :-

<table>
<thead>
<tr>
<th>(P_L(\theta))</th>
<th>11.1</th>
<th>20.5</th>
<th>22.7</th>
<th>28.6</th>
<th>31.2</th>
<th>30.9</th>
<th>27.6</th>
<th>24.1</th>
<th>18.7</th>
<th>11.9</th>
</tr>
</thead>
<tbody>
<tr>
<td>Angle (\theta)</td>
<td>0</td>
<td>20</td>
<td>40</td>
<td>60</td>
<td>80</td>
<td>100</td>
<td>120</td>
<td>140</td>
<td>160</td>
<td>180</td>
</tr>
</tbody>
</table>

Estimate the total grain boundary length per unit area. Provide the answer correct up to two decimal points. (Hint: Use Excel to generate the regression line and obtain the equation)

No, the answer is incorrect.
Score: 0

Accepted Answers:
(Type: Range) 36.500,39.000
3) Fill in the blanks:
Relative grain boundary energies at triple edges are calculated using ________ equations.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) youngs
(Type: String) young’s

0.5 points

4) Fill in the blanks:
__________________________ are used instead of linear probes in the form of a grid of parallel lines in order to obtain an average intercept length for oriented polycrystalline microstructures.

No, the answer is incorrect.
Score: 0
Accepted Answers:
(Type: String) Circular probes
(Type: String) varying direction
(Type: String) varying direction linear probes

0.5 points

5) The extent of the orientation of grains in a polycrystalline microstructure is the sum of isotropic and oriented boundary lengths

True
False

No, the answer is incorrect.
Score: 0
Accepted Answers:
False

5 points

6) A kind of linear probe used to measure intersections in all directions at equal intervals is the varying angle probe

True
False

No, the answer is incorrect.
Score: 0
Accepted Answers:
True

5 points

7) A 3D space is sectioned by a dissector. The particles to be included in the count will be:

Those found only in the look up plane

1 point
8) The 95% confidence interval for the no. of grains per unit area (using the three masks given below) is approximately:

- 5.5 to 6.0
- 6.5 to 7.0
- 7.5 to 8.0
- 8.5 to 9.0

No, the answer is incorrect.
Score: 0
Accepted Answers:
6.5 to 7.0

9) Figure shows the indent formed by a Vickers indenter. Diagonal lengths of the two indents are: $D_1 = 850 \, \mu m$ and $D_2 = 148 \, \mu m$. The disector thickness will be approximately:
10 Which of the following is the correct polar plot for the completely oriented components?

- 50 μm
- 100 μm
- 150 μm
- 200 μm

No, the answer is incorrect.
Score: 0
Accepted Answers:
100 μm

1 point
No, the answer is incorrect.
Score: 0
Accepted Answers: