

Course outline

How does an NPTEL online course work?

Week 0

Week 1

Week 2

Week 3

Week 4

Week 5

Week 6

Lecture 26 : Texture Goniometer Components

Lecture 27 : Limitations and Errors in X-ray Texture Measurement and Corrections

Lecture 28 : Basics of Electron Microscopy - I

Lecture 29 : Basics of Electron Microscopy - II

Week 6 Lecture material

Quiz: Week 6 : Assignment 6

Week 6 Feedback Form

Week 7

Week 8

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Week 11

Week 12

Download Videos

Assignment Solution

Live Interactive session

Week 6 : Assignment 6

The due date for submitting this assignment has passed.

Due on 2021-09-08, 23:59 IST.

As per our records you have not submitted this assignment.

1) Defocussing error in x-ray texture measurements occurs due to:

1 point

- (a) Peak broadening attributed to sample tilting.
 (b) Absorption of radiation attributed to sample tilting.
 (c) Peak broadening attributed to sample rotation about its axis.
 (d) Absorption of radiation attributed to sample rotation about its axis.

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a) Peak broadening attributed to sample tilting.

2) Why multiple pole figures are measured in x-ray goniometer?

1 point

- (a) Because no plane normal could be measured by χ tilting and ϕ rotation.
 (b) Because only plane directions could be measured by χ tilting and ϕ rotation.
 (c) Because a pole figure could not be measured from χ tilting from 0° to 20° .
 (d) None of the above.

No, the answer is incorrect.

Score: 0

Accepted Answers:

 (c) Because a pole figure could not be measured from χ tilting from 0° to 20° .

3) Which of the following sentences are true regarding x-ray texture measurements?

1 point

- (a) Defocussing error can be reduced by using wider receiving slit and narrower divergent slit.
 (b) Background error can be reduced by using wider receiving slit and narrower divergent slit.
 (c) Defocussing error can be reduced by using narrower receiving slit and wider divergent slit.
 (d) Background error can be reduced by using narrower receiving slit and wider divergent slit.

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a) Defocussing error can be reduced by using wider receiving slit and narrower divergent slit.

(d) Background error can be reduced by using narrower receiving slit and wider divergent slit.

4) Pole figure cannot be measured for:

1 point

- (a) $\alpha \geq 70^\circ$;
 (b) $\theta \leq 10^\circ$;
 (c) $\alpha \leq 70^\circ$;
 (d) $\theta \geq 10^\circ$;

No, the answer is incorrect.

Score: 0

Accepted Answers:

 (a) $\alpha \geq 70^\circ$;
 (b) $\theta \leq 10^\circ$;

5) Normalization of intensities to standard units (MRD) is done:

1 point

- (a) To correct the errors due to the background and peak broadening.
 (b) To remove the effect due to absorption.
 (c) to decrease the standard deviation in the pole figure due to statistical scatter.
 (d) to make the pole figure data independent of experimental parameters.

No, the answer is incorrect.

Score: 0

Accepted Answers:

(d) to make the pole figure data independent of experimental parameters.

 6) **Elastically backscattered electrons are generated by:**

1 point

- (a) Interaction of incident e^{-1} beam with $e^{-1}s$ present in the e^{-1} cloud of the specimen.
 (b) Interaction of incident e^{-1} beam with atomic nucleuses of the specimen.
 (c) Interaction of incident e^{-1} beam with conduction and valence band $e^{-1}s$ of the specimen.
 (d) None of the above.

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

b

 7) **Which of the following sentence/s are correct?**

1 point

- (a) Inelastically scattering of $e^{-1}s$ occurs when incident e^{-1} beam scatter multiple times in the specimen without losing detectable amount of energy.
 (b) Elastically scattering of $e^{-1}s$ occurs when incident e^{-1} beam scatter in the specimen losing a detectable amount of energy.
 (c) The number of times e^{-1} scattering takes place, the scattering angles decreases and the loss of energy decreases.
 (d) None of the above.

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

d

 8) The probability of scattering of the incident e^{-1} beam:

1 point

- (a) decreases as the scattering angle increases.
 (b) through an angle decreases as the energy of the incident beam increases.
 (c) decreases as the scattering angle reduces.
 (d) through an angle increases as the energy of the incident beam increases.

No, the answer is incorrect.

Score: 0

Accepted Answers:

(a) decreases as the scattering angle increases.

(b) through an angle decreases as the energy of the incident beam increases.

9) In TEM:

1 point

- (a) The Bragg's law is relaxed as the wavelength of e^{-1} beam is extremely low.
 (b) The spacing of reciprocal lattice poles are inversely proportional to the interplanar spacing of the crystallographic planes
 (c) The diffracted beams intensity decreases largely with the small increase in the Bragg's angle.
 (d) The reciprocal lattice points elongate normal to the specimen plane as the specimen gets thinner and the chance of Ewald sphere touching these elongated points increases.

No, the answer is incorrect.

Score: 0

Accepted Answers:

 (a) The Bragg's law is relaxed as the wavelength of e^{-1} beam is extremely low.

(b) The spacing of reciprocal lattice poles are inversely proportional to the interplanar spacing of the crystallographic planes

(c) The diffracted beams intensity decreases largely with the small increase in the Bragg's angle.

(d) The reciprocal lattice points elongate normal to the specimen plane as the specimen gets thinner and the chance of Ewald sphere touching these elongated points increases.

 10) **Kikuchi pattern forms when:**

1 point

- (a) Incident $e^{-1}s$ inelastically scatter and finally elastic reinforced scattering takes place due to periodic structure.
 (b) Incident $e^{-1}s$ knocks down $e^{-1}s$ from the inner shells in the target metal.
 (c) Incident $e^{-1}s$ with sufficient energy interacts with conduction and valence band $e^{-1}s$ of the target metal.
 (d) None of the above

- a
 b
 c
 d

No, the answer is incorrect.

Score: 0

Accepted Answers:

a