

Assignment 10

1] A dislocation has to pass from a disordered structure to an ordered structure. During this phenomena which of the following is expected to occur:

- a) Dislocation destroys at the interface of both phases
- b) Passage of matrix dislocation generates an APB in its wake**
- c) Dislocation forms a loop around the ordered phase
- d) A barrier is formed that obstructs further motion of dislocation

2] Mention the correct choices with respect to Twinning:

- a) The twinned and the untwined portion can be related by inversion.
- b) The term compound twins are specifically used for cubic structures**
- c) For a non-primitive cubic lattice, shuffling is not necessary to generate a true twin
- d) Any partial dislocation can generate deformation twin

3] Mention the correct choices with respect to anti phase boundaries:

- a) Anti phase boundaries are usually seen in ordered alloys**
- b) Dislocations with burgers vector, $b = \frac{1}{2}\langle 111 \rangle$ are called super partials
- c) The super dislocations do not split into super-partial
- d) The disordered region in an ordered alloy is bounded by two super dislocations

4) Identify the correct statement with respect to fcc twin

- a) Homogenous deformation can produce mechanical twin**
- b) Twinning can be produced by passage of extrinsic stacking fault on successive slip planes in fcc lattice
- c) Twinning can be produced by passage of intrinsic stacking fault on successive slip planes in fcc lattice.**
- d) Twinning can be produce by movement of $\frac{1}{3}\langle 111 \rangle$ partial dislocations in fcc lattice

5) Choose all the correct answers regarding jogs

- a) Jogs are always produced by interaction of dislocations irrespective of their nature (edge or screw)
- b) Jogs produced due to interaction between two edge dislocations always have screw character.

c) Jogs produced due to interaction between two edge dislocations always have edge character.

d) Kinks produced due to interaction between two edge dislocations have screw character.

6) Choose all the correct answers regarding Frank read source

a) Frank Read source can produce dislocations in the absence of external stress field.

b) Frank Read source can produce infinite number of dislocations.

c) Applied external stress has an influence on the number of dislocations a Frank Read source will produce

d) Frank Read source is an equilibrium defect in the sample

7) Choose the correct statements

a) Jogs on edge dislocations move with the same velocity as the dislocation itself.

b) Jogs produced by interaction between two edge dislocations increase work hardening.

c) Kinks always lie in the slip plane irrespective of the character of the dislocation

d) Kinks on screw dislocation have screw character

8) Choose the correct answers with respect to pile up of dislocations

a) Stress trying to move the first dislocation in a pile up is the same as applied stress.

b) Stress on the first dislocation is decided by the strength of the obstacle ahead of it

c) Stress trying to move the first dislocation in a pile up is 'n' times the applied stress where 'n' is the number of dislocations in the slip plane.

d) Stress on the first dislocation depend on force acting between adjacent dislocations

9) Glide of a jogged screw dislocation produces

a) Vacancies in its wake

b) Superjogs

c) Interstitial loops

d) Shear loops

10) Identify all the correct answers with respect to anti phase boundaries

- a) Anti-phase boundaries are produced only during deformation of ordered alloys
- b) Anti-phase boundaries are produced by movement of super-dislocations in ordered lattice.

c) Translation symmetry element lost during ordering transformation appear as anti-phase boundary defect vector in ordered structure

- d) Rotational symmetry element lost during ordering transformation appear as anti-phase boundary defect vector in ordered structure