Assignment 09

1] Any combination of perfect dislocations on a plane will give rise to which type of a dislocation?

a) A Partial dislocation

b) A Stair rod dislocation

c) A Perfect dislocation

d) A Lomer Lock

2] What is the effect of is reaction of two dislocations of the type a/2[01-1] and a/2[101] lying on different slip planes on mechanical behaviour? What is the nature of the resulting dislocation?

- a) Material hardens, sessile
- b) Material softens, glissile
- c) No change in material behaviour, glissile

d) No change in material behaviour, sessile

3] Choose the most appropriate answer with respect to extrinsic stacking faults in FCC crystal:

i- Fault is eventually lying on only one plane

ii- Combined motion of two partials on adjacent slip planes can result in the formation of extrinsic stacking faults

iii- Energy of these faults is higher than that of intrinsic stacking faults.

- iv-Burgers vector of partial is always perpendicular to fault plane
- a) i and ii
- b) i, ii and iii
- c) ii and iii
- d) i, ii, iii and iv

4] The yielding in a BCC material is controlled by the edge dislocation. State the correct statement in this regard.

a) Edge dislocation is associated with a core that splits in three directions and counteracts the force on one direction.

b) Screw dislocations can easily cross-slip and hence are free to move

c) Only at very high stresses the edge dislocations are allowed to glide due to associated core

d) Interstitial solutes diffuse to dislocations

5] Mention the correct choices with respect to dislocations in HCP structure:

a) Slip occurs on basal plane if c/a ratio is >= 1.63

b) Slip occurs on basal plane if c/a ratio is < 1.63

c) Basal and pyramidal are the only slip planes in HCP structure

d) [0001] depicts the 'c-type' dislocation in HCP

6] For the given Thomson tetrahedra, mention the valid choices:



a) The surface of the tetrahedra represents slip planes

- b) Thomson tetrahedra is only valid for FCC structures
- c) Movement of Cα, Cβ and Cδ will produce intrinsic stacking faults
- d) Edges of the tetrahedra represent the perfect dislocations
- 7] Match the following and answer according to the choices provided

<u>Set 01</u>	<u>Set 02</u>
A) High Stacking Fault Energy	P) Favoured for Partial Dislocations
B) Low Stacking Fault Energy	Q) Work Hardening Easier
C) Two Dislocation Interact with acute angles	R) Cross Slip Easier
	S) Repelling Dislocations
	S) Attracting Dislocations

- a) A-P, B-S, C-Q
- b) A-Q, B-P, C-R
- c) A-Q, B-S, C-Q
- d) A-Q, B-P, C-S