## Assignment 5

## Solution

1] When a sample is subjected to a plastic strain $\varepsilon_{p}$, this strain is
a) nothing but pure shear strain
b) pure shear strain plus rotation
c) shear strain tensor component
d) pure tensile strain

2] Tensor of second rank is always a relation between
a) One vector and one scalar
b) Two vectors
c) Two scalar
d) All the above

3] Diffusivity is a second rank matter tensor which gives a relation between
a) Thermal gradient (negative) and concentration gradient (negative)
b) Concentration gradient (negative) and flux of atoms
c) Concentration gradient and chemical potential gradient
d) None of the above

4] The symmetry elements of a physical property of a crystal must include the symmetry element of the point group of the crystal. This is known as
a) Galois theory
b) Neumann's principle
c) Kepler's theory
d) Principle of symmetry

5] A property tensor always exhibit
a) An inversion symmetry
b) Mirror symmetry
c) No symmetry
d) Two fold rotational symmetry

6] In the given tensor notation, j is called dummy suffix because

$$
p_{i}=T_{i j} q_{j}
$$

a) It is getting repeated in right hand side of the equation.
b) It is subscript with last vector of the equation.
c) It does not matter which letter it is taken to represent it except i .
d) There is no reason as such.

7] Consider a unit cube. Strains along three orthogonal directions are applied as shown and a volume change $\Delta$ is generated. The cube is then subjected to a rotation of 180 degrees anticlockwise. What will be the new volume?


## Volume doesn't change

 with rotation as there is no deviator component of strain presenta) The body is irrotational
b) Volume remains unchanged
c) New volume would be $1 / \Delta$
d) Net volume change is $\Delta$

8] Three tensor matrices related to simple shear $g$ is given. Identify the correct statement(s) regarding $A, B$ and $C$ ?

a) No relation between $A, B$ and $C$
b) A represents symmetric pure rotation tensor
c) C represents rotational strain tensor
d) $A$ and $C$ are related to $B$

