

## Assignment 7

- 1) For biological sample inspection in SEM, the mode used is
  - ESEM (Environmental SEM)
  - Low Vacuum
  - High vacuum
- 2) Energy of Backscattered electrons is \_\_\_\_\_(than) secondary electrons
  - same as
  - lower
  - greater
- 3) Interaction volume is dependent on \_\_\_\_\_
  - beam energy
  - specimen material
  - angle of incidence
  - All of the above
- 4) If the condenser lens strength increases, the demagnification \_\_\_\_\_ and the probe size \_\_\_\_\_
  - increases and decreases
  - decreases and increases
  - both increases
  - both decreases

- 5) Gaussian probe diameter is
- diameter with spherical aberration
  - diameter with chromatic aberration
  - ideal diameter with no aberration
  - with both spherical and chromatic aberration
- 6) The secondary electron (SE) yield and back scattered electron (BSE) yield increases as the glancing angle of incidence
- decreases
  - increases
  - remains constant
  - increases and immediately decreases
- 7) Which of the following mode of imaging is preferred for good topographical contrast?
- BSE mode
  - SE mode
  - EBSD
  - EDS or WDS
- 8) Photo multiplier detector is used for \_\_\_\_\_ imaging
- EBSD
  - topographical contrast
  - 'Z' or atomic contrast
  - WDS

9) Back scattered electrons are produced due to the \_\_\_\_\_

- thermally activated electrons
- free electrons in sample
- inelastic scattering
- elastic scattering

10) As the applied voltage increases, the interaction volume \_\_\_\_\_

- increases
- decreases
- remains constant
- fluctuates with time

11) Magnification in SEM is dependent on excitation of

- scan coils
- objective lens
- condensor lens
- None of the above

12) \_\_\_\_\_ contrast component arises when contrast is carried by certain portion of BSE energy distribution

- Trajectory
- Energy
- Number
- All of the above

13) Depth of focus can be given by \_\_\_\_\_, where  $\alpha$ =semi apex angle/ angle of beam convergence and  $r$ =half of maximum field of view which remain in focus

- $2\alpha/r$
- $\alpha/2r$
- $2r/\alpha$
- $r/2\alpha$

## Assignment 8

- 1) The slope of curve  $\eta$  (backscattering coefficient) Vs Z (atomic number) \_\_\_\_\_ with increase in Z value
  - decreases
  - increases
  - constant
  
- 2) The trajectory for back scattered electrons and secondary electrons in SEM is \_\_\_\_\_
  - straight and curved respectively
  - curved and straight respectively
  - curved for both
  - straight line for both
  
- 3) Voltage contrast arises due to
  - variation in local surface potential
  - localized specimen charging
  - insulating inclusions
  - All of the above
  
- 4) The leakage magnetic field that causes contrast variation is mainly due to
  - magnetic domains passes through the free surface
  - free electrons at sample surface
  - magnetic second phase particles in sample

- 5) How the image appear in SEM, when the magnetic field contrast is present?
- with brightest surface
  - complete dark surface
  - with bright and dark bands
  - without any change in contrast
- 6) How the channeling effect occurs in the path of low atomic density?
- due to absorption of fraction of electrons by the sample
  - due to penetration of some fraction of electron beam more deeply before scattering
  - due to penetration of some fraction of electron beam more deeply after scattering
  - due to immediate scattering of electron beam
- 7) In kikuchi pattern why the kossel cones appear as straight lines on screen?
- angle involved is very small
  - angle involved is very large
  - angle involved can not be measured
- 8) The seperation between two lines of kikuchi band gives \_\_\_\_\_
- inter planar spacing
  - the angle theta
  - the angle two theta
  - lattice parameter
- 9) During EBSD measurement the sample will be tilted \_\_\_\_\_
- 0 degrees and rotated to 360 degrees
  - 50 degrees
  - 90 degrees
  - 70 degrees