

Assignment 4

- 1) As the gradient of optical path difference grows shallow, image contrast _____ in Differential interference contrast microscopy
- increases
 - remains un altered
 - decreases
- 2) Closely spaced rays are generated by _____ for sample inspection in DIC microscope
- Beam splitter
- 3) In the DIC microscopy, amplitude is related to the _____ of optical path difference profile
- Derivative
- 4) Fluorochromes exhibit distinct excitation and emission spectra that depends on their
- atomic structure and electron resonance properties
 - atomic weight and electron resonance properties
 - atomic structure and atomic weight
- 5) Dichromatic mirror in fluorescence microscope is made of multiple layers of _____ material
- Dielectric
- 6) Which crystal is generally used in the generation of polarised light among the following?
- Alumina
 - Gold
 - Calcite
 - Quartz
- 7) What property allows transparent crystals' use in polarisation microscopy?
- optically isotropic
 - optically anisotropic
 - both a and b
 - none
- 8) The purpose of using compensator in polarisation microscope is to get
- good resolution
 - relative retardation
 - specific phase shift
 - both b and c
- 9) Elliptically polarised light has
- different propagation axis but vibrate in mutually parallel planes
 - same propagation axis but vibrate in mutually parallel planes
 - different propagation axis but vibrate in mutually perpendicular planes
 - same propagation axis but vibrate in mutually perpendicular planes

Assignment 5

- 1) Establishing Unity magnification eliminates both
- Curvature of field and astigmatism
 - Coma and Lens distortion
 - Spherical aberration and astigmatism
 - curvature of field and Coma
- 2) Correction of astigmatism in electron microscopy is possible by insertion of _____ in lens system to compensate the non-circularity of the image beam profile on the image plane
- Apertures
 - optical lens
 - Stigmators
- 3) Space charge effect associated with low beam intensity is less at _____
- low voltage
 - high voltage
 - all voltages
- 4) Optimum size of aperture obtained by taking both resolution and lens aberration into consideration is proportional to _____, where C_s = coefficient of spherical aberration and λ is wavelength of electron beam
- $(C_s/\lambda)^{0.25}$
 - $(\lambda/C_s)^{0.25}$
 - $(\lambda/C_s)^{0.5}$
 - $(C_s/\lambda)^{0.5}$

5) Coefficient of spherical aberration is proportional to _____, where V=Potential, N=number coils and I=current

- $(NI)^4/N^2$
- $((VN)^2/I^4)$
- $V^2/(NI)^4$
- $(I^4/(VN)^2)$

6) Most widely used filament materials in electron microscopes are

- Lanthanum hexa boride (LaB6)
- Tungsten(W)
- Zirconium (Zr)
- Both a and b
- Both b and c

7) why to use Wehnelt cylinder near electron gun?

- to increase the intensity of electron
- to make the electrons cross over
- to accelerate electrons
- to decelerate electrons

8) Generally, the brightness of

- thermionic tip is greater than field emitting tip
- field emitting tip is greater than thermionic tip
- equal in both thermionic and FE tips
- not predictable

9) Energy spread of electrons is

- Less in FE tip than thermionic tip
- Less in thermionic tip than FE tip
- equal in both tips
- can not predict