

## Assignment 1

- 1) As the spacing in a grating increases the distance between the corresponding diffraction spots
  - increases
  - decreases
  - remains same
  
- 2) Resolution of a microscope or imaging system is dependent on
  - Refractive index of the medium
  - wavelength of the illuminating source
  - Apex angle
  - All of the above
  
- 3) According to Abbe's criterion atleast \_\_\_\_\_ diffracted beams from object should enter the objective lens for image formation
  - Five
  - Four
  - Three
  - Two
  
- 4) Diffraction pattern appears \_\_\_\_\_ to grating direction
  
- 5) Light has charectre of
  - Wave
  - Quanta
  - Both wave and quanta
  - inert

- 6) If 'x' is the distance between the object and lens and 'y' is the distance from the lens to the image, then the magnification is
- x/y
  - x\*y
  - y/x
  - x+y
- 7) When two waves of same amplitude and phase difference of half the wavelength interacts \_\_\_\_\_ interference takes place.
- destructive
- 8) The ray which passes through the center of lens
- deviates from its path
  - passes through the center without deviation
  - passes through the center with deviation
  - refracts at an angle of 45 degrees

## Assignment 2

- 1) Light grasp of a microscope depends on
- Diameter of objective lens
  - Focal length of objective lens for a given diameter
  - Both of the above
  - None of the above
- 2) Collection angle for immersion objective lens is \_\_\_\_\_ (than) dry objective lens
- smaller
  - greater
  - same as
- 3) The range of positions of the object for which our eye can detect no change in the sharpness of the image is
- Depth of field
  - Depth of focus
  - Field of view
  - None of the above
- 4) Field of view of a microscope depends on
- objective lens
  - Occular lens or eye piece
  - magnification of microscope
  - All of above
  - None of above

- 5) Transparent specimens are invisible under microscope because the difference in intensity of background and specimen/object is
- infinity
  - 1
  - 0
- 6) Spherical aberration can be eliminated by use of
- Converging lens with high refractive index
  - Combination of converging and diverging lenses with same refractive index
  - Diverging lens with high refractive index
  - Combination of converging and diverging lenses with different refractive index
- 7) Chromatic aberration arises with
- Monochromatic light
  - Polychromatic light
  - Coherent light
  - Incoherent light
- 8) What is achromatic doublet
- Combination of lenses to eliminate spherical aberration
  - Combination of lenses to eliminate chromatic aberration
  - Combination of lenses to eliminate both spherical and chromatic aberration
  - None of the above
- 9) What are the lenses present in eyepieces
- Condenser lens and eye lens
  - Objective lens and field lens
  - Field lens and eye lens
  - Objective lens and eye lens
- 10) Filters are used to adjust
- Intensity of illumination
  - Wavelength of illumination
  - Both intensity and wavelength
  - amplitude of illumination

### Assignment 3

- 1) In phase contrast microscopy, the contrast is due to the difference in
  - optical path length
  - phase
  - refractive index of specimen/material and medium
  - thickness of specimen/material
  - All of the above
  
- 2) Function of a phase plate in phase contrast microscopy is to
  - advance the phase
  - reduce the amplitude
  - both of the above
  - none of the above
  
- 3) A pure amplitude object absorbs energy and reduces the \_\_\_\_\_ but no change in the \_\_\_\_\_
  - amplitude, intensity
  - phase, amplitude
  - amplitude, phase
  - intensity, amplitude
  
- 4) In a phase contrast microscope, the refractive index of medium and specimen are 1.2 and 1.7 respectively. For a 2 micron thick specimen what is the optical path length difference generated?
  - 2 micron
  - 1 micron
  - 0.5 micron
  - 0.25 micron

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- 5) Transmission optical microscope has the following modes
- Bright field and dark field
  - Bright field and polarised light
  - Dark field and polarised light
  - only polarised light
- 6) Which of the condenser aperture lenses are used for phase contrast mode in transmission optical microscope?
- lens 1 and 2
  - lens 3
  - len 2 and 3
  - lens 4 and 5
- 7) In bright field imaging of OM, the high reflectivity of the material leads to
- poor contrast
  - poor resolution
  - high image quality
  - none of the above
- 8) If the sample is not focussed completely in OM, what it infer?
- Sample is a nonconductor
  - Sample is a good conductor
  - Sample has flat surface
  - sample surface is irregular