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BRAINWARE UNIVERSITY

Term End Examination 2023
Programme – B.Sc.(BT)-Hons-2020
Course Name – Bio Analytical Tools
Course Code - BBTC601
(Semester VI)

Full Marks : 60 **Time : 2:30 Hours**

[The figure in the margin indicates full marks. Candidates are required to give their answers in their own words as far as practicable.]

Group-A

(Multiple Choice Type Question) 1 x 15=15

1. *Choose the correct alternative from the following :*

(i) The greatest resolution in light microscopy can be obtained with __

a) Longest wavelength of visible light used
b) An objective with minimum numerical aperture
c) Shortest wavelength of visible light used
d) Shortest wavelength of visible light used and an objective with the maximum numerical aperture

(ii) In fluorescence microscopy, which of the following performs the function of removing all light except the blue light?

a) Exciter filter
b) Barrier filter
c) Dichroic mirror
d) Mercury arc lamp

(iii) Total Magnification is obtained by

a) Magnifying power of the objective lens
b) Magnifying power of eyepiece
c) Magnifying power of condenser lens
d) Magnifying power of both the objective lens and eyepiece

(iv) In light microscopy, which of the following is used as fixatives prior to staining technique?

a) Osmic acid
b) Glutaraldehyde
c) Heat
d) Osmic acid, glutaraldehyde, heat

(v) Which of the following is used in electron microscope?

a) electron beams
b) magnetic fields
c) light waves
d) electron beams and magnetic fields

(vi) Negative Staining is used for examining

a) virus particles
b) protein molecules
c) bacterial flagella
d) virus particles, protein molecules and bacterial flagella

(vii) Which among the following helps us in getting a three-dimensional picture of the specimen?

a) Transmission Electron Microscope
b) Scanning Electron Microscope
c) Compound Microscope\\
d) Simple Microscope

(viii) The secondary electrons radiated back in scanning microscope is collected by?

a) specimen
b) anode
c) vacuum chamber
d) cathode

(ix) On what factors do the intensity of secondary electrons depend upon?

a) shape of the irradiated object
b) chemical composition of the irradiated object
c) number of electrons ejected
d) size and chemical composition of the irradiated object, number of electrons ejected and on the number of electrons reabsorbed by surrounding

(x) The electrodes used in pH measurement have which of the following internal resistances?

a) Very low resistance
b) Moderate resistance
c) Very high resistance
d) No resistance

(xi) Which of the following is not a failure in pH meters?

a) Defective electrodes
b) Defective input circuitry
c) Defective electronic circuitry
d) Defective calibration

(xii) Which of the following is the simplest of pH meters?

a) Null-detector type pH meter
b) Direct reading type pH meter
c) Digital pH meter
d) Modern pH meter

(xiii) Which part of the compound microscope helps in gathering and focusing light rays on the specimen to be viewed?

a) Eyepiece lens
b) Objective lens
c) Condenser lens
d) Magnifying lens

(xiv) What is the minimum distance for the eye to focus any object?

a) 11 cm
b) 25 cm
c) 45cm
d) 15 cm

(xv) Resolving power of a microscope is a function of _____

a) Wavelength of light used
b) Numerical aperture of lens system
c) Refractive index
d) Wavelength of light used and numerical aperture of lens system

Group-B

(Short Answer Type Questions) 3 x 5=15

2. Write short notes on microscopy. (3)
3. Distinguish between simple and compound microscope. (3)
4. Briefly explain about the pH meter. (3)
5. Write short notes on spectrophotometer. (3)
6. Explain nanotechnology. (3)

OR

Explain biosensors. (3)

Group-C

(Long Answer Type Questions) 5 x 6=30

7. What are some practical applications of the properties of light (5)
8. How are wavelength, frequency, wave number, and velocity of a wave inter-related? (5)
9. Criticize on some forms of light that cannot be seen by the human eye and why not? (5)

10. Summarize what is darkfield microscopy and why did its popularity increase with the discovery of Treponema pallidum? (5)
11. Choose the prerequisites that should be ensured while using dark field microscopy and why is a bright light source recommended? (5)
12. Debate on the fate of an electron striking an object while coming in contact with a sample. (5)

OR

Distinguish between secondary electrons and backscattered electrons? (5)

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