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(26 F35)

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SARDAR PATEL UNIVERSITY
M. Sc. Microbiology/Biotechnology Ist Semester Examination
PS01CMIC02/PS01CBIT02: Bioinstrumentation
Wednesday, 22/04/2015

Time: 10: 30 a.m. to 1:30 p.m.

Max. Marks: 70

Note: Figures on the right indicate marks.

- Q.1 Choose the most appropriate answer (08)
- i The proteins can be separated on the basis of their difference in net charge by
a) Affinity chromatography b) Ion exchange chromatography
c) Dialysis d) Gel filtration chromatography
- ii _____ is the ability to reveal closely adjacent points as separate and distinct.
a) magnification b) resolution c) numerical aperature d) contrast
- iii The intensity of light entering the microscopy can be controlled by
a) iris diaphragm b) mirror c) condenser d) all of the above
- iv Which of the following microscopes is useful in observing stained objects?
a) Bright-field Microscope b) SEM c) TEM d) Phase contrast microscope
- v Which of the following centrifugation technique is based on buoyant density?
a) Density gradient centrifugation b) Differential centrifugation
c) Isopycnic centrifugation d) None of the above
- vi _____ is commonly used as source of radiation in visible region in spectrophotometer.
a) Global b) Electron gun c) Deuterium lamp d) Tungsten lamp
- vii ¹HNMR spectroscopy can be employed to
a) determine different types of protons in a molecule
b) quantify metal ions in a sample
c) determine mass of a molecule
d) determine types of elements in a molecule
- viii _____ cannot be eliminated by performing scintillation based counting of radioactivity in dark
a) chemiluminescence b) color quenching
c) optical quenching d) all of the above

- Q.2 Attempt any SEVEN of the following (14)
- a) Differentiate between adsorption and partition chromatography
 - b) Define: lens aberration
 - c) Enlist advantages of capillary electrophoresis over conventional electrophoresis
 - d) Explain the term buoyant density
 - e) State Beer's and Lambert's law
 - f) Draw a labeled ray diagram of a single beam spectrophotometer
 - g) State Bragg's law
 - h) What is Cerenkov light?
 - i) Differentiate fixed angle rotor and swinging bucket rotor
- Q.3 a. Enlist the type of filters used in fluorescence microscope and explain their functions. (06)
- b. Multiple parameter analysis is possible with flowcytometer. Explain (06)
- OR
- b. Explain the basic instrumentation of scanning tunneling microscope (06)
- Q.4 a. Explain isotachopheresis and electroendosmosis (06)
- b. Explain the basic instrumentation of gas liquid chromatography (06)
- OR
- b. Write a note on: Ion exchange chromatography (06)
- Q.5 a. Write a note on: Scintillation counting of radioactivity. (06)
- b. Explain instrumentation of MALDI-TOF in brief and discuss its applications. (06)
- OR
- b. Write a note on: Differential centrifugation (06)
- Q.6 a. Write in brief on different components of a UV-Visible spectrophotometer and discuss its any two applications in detail. (06)
- b. Explain the principle of AAS. Describe any one method of atomization in detail. (06)
- OR
- b. Write a note on: Sources of radiation and detectors employed in IR spectroscopy (06)

-X-X-X-X-X-