

SARDAR PATEL UNIVERSITY  
M.Sc. Integrated Biotechnology Fifth Semester Examination  
Friday 7<sup>th</sup> DEC 2012  
PS05CIGB05: Bioinstrumentation  
10:30 am – 1:30 pm

Total Marks 70

- Note: (i) Figures to the right indicate marks.  
(ii) Draw neat and labeled diagram, wherever necessary.

Q-1 Fill in the gaps by choosing appropriate option.

[8x1=8]

- (1) A characteristic feature of any form of chromatography is the
  - (a) Use of an inert gas
  - (b) Use of a mobile and a stationary phase
  - (c) Calculation of an Rf value for the molecules separated
  - (d) use of molecules that are soluble in water
- (2) In 1909, \_\_\_\_\_ introduced the term pH as a convenient way of expressing hydrogen ion concentration
  - (a) Sorenson
  - (b) Henderson
  - (c) Hasselbalch
  - (d) Frederick
- (3) Agarose comprises alternating units of \_\_\_\_\_ and 3,6-anhydrogalactose
  - (a) galactose
  - (b) glucose
  - (c) sucrose
  - (d) maltose
- (4) Calomel is the name for \_\_\_\_\_ which is soluble in water.
  - (a) KCl
  - (b) AgCl
  - (c) Hg<sub>2</sub>Cl<sub>2</sub>
  - (d) HCl
- (5) The resolving power of light microscope is
  - (a) 10 μm
  - (b) 100 μm
  - (c) 10 nm
  - (d) 100 nm
- (6) Ammonium persulphate generates a \_\_\_\_\_ radical during gel polymerisation
  - (a) free
  - (b) neutral
  - (c) non
  - (d) none of these
- (7) What is ethidium bromide?
  - (a) Buffer
  - (b) Dye
  - (c) DNA solution
  - (d) Restriction enzyme
- (8) The phenomenon of fluorescence was first described by
  - (a) M. Knoll
  - (b) George Stokes
  - (c) Frederick Zernick
  - (d) E. Ruska

Q-2 Answer the following questions in short. (Any seven)

[7x2=14]

- (1) Explain the function anion exchanger using chemical equation.
- (2) Enlist the methods to determine pH of a given solution.
- (3) Compare Light microscope with Electron microscope.
- (4) Enlist the applications of fluorescence microscopy.
- (5) Write advantages and disadvantages of pH indicators.
- (6) Write a brief note on supports used in HPLC.
- (7) Describe 'Photopolymerisation' in brief.
- (8) Give a brief note on 'safety aspects in use of centrifuges'.
- (9) Write a short note on gradient gels.

Q-3 (A) Enlist different types of rotors used in centrifuges describing any 2 in detail.

[6]

(B) Write a note on conductimetric titration.

[6]

OR

(B) Explain the formation of glass and Calomel electrodes giving their importance.

Q-4 (A) Explain the principle, construction and working of phase contrast microscope.

[6]

(B) Describe the construction and working of light microscope.

[6]

OR

(B) Discuss about SEM and TEM.

- Q-5 (A) Elaborate the process of enzyme purification by the technique of affinity chromatography. [6]  
(B) Describe gel filtration chromatography in detail. [6]  
OR  
(B) Write an explanatory note on TLC technique.
- Q-6 (A) Discuss the principle, methodology and applications of SDS-PAGE. [6]  
(B) Explain the technique of agarose gel electrophoresis. [6]  
OR  
(B) Describe the 2-D gel electrophoresis alongwith its applications. [6]

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