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# SARDAR PATEL UNIVERSITY

## EXTERNAL EXAMINATION –NOVEMBER-2013

V- semester. Biochemistry.

### US05CBCH06 -BIOINSRUMENTATION

TIME: 10.30<sub>am</sub>-1-30<sub>pm</sub>

date: 25/11/13

MARKS:70

#### Q-1 Multiple choice questions: (all are compulsory)

10

- 1 Light of definite wavelength extending to----- for spectrophotometric analysis  
a) Visual region    b) infrared region    c) U. V. Region    d) non ultra region
- 2 Radiation should be -----For suitable absorption measurement in spectrometric analysis  
a) Stable & uncontinuous    b) Unstable & uncontinuous  
c) Stable & continuous    d) Unstable & continuous
- 3 Synthetic resins are prepared by  
a) Copolymerizing    b) sulphonation    c) Denaturation    d) Equilbration
- 4 IEC is useful for purification of all types of  
a) Protein    b) Enzyme    c) Nucleic acid    d) All Three
- 5 Acrylamide monomer of gel is polymerised into  
a) Head to tail fashion    b) Chain extention    d) Tail to head fashion    d) none of the above
- 6 The partical of same mass but different in only density can be seperated by  
a) differential method    b) rate zonal    c) isophycnic    d) any one
- 7 To monitoring protein purification commonly used gel is  
a) SDS polyacrylamide    b) Acrylamide    c) Agarose    d) all three
- 8 Agarose and agarose based gel has  
a) Greater rigidity and small pore size    c) Lower rigidity and small pore size  
b) Greater rigidity and larger pore size    d) Lower rigidity and larger pore size
- 9 Rate zonal method is mainly based on separation of cells on the basis of difference in  
a) molecular weight    b) density    c) shape    d) difference in size
- 10 Sepharoses can  
a) Sterilized by autoclaving    c) Distintegrate below 20 °C  
b) Not Sterilized by autoclaving    d) Structurally stable

Conti...

**Q-2 Answer the following: (any ten)**

**10**

- 1 Enlist with examples on the elements present in simple colorimeter.
- 2 Explain shifts in colorimetric analysis.
- 3 write constituents of barrier layer cell
- 4 Explain mechanism of polymerization for acrylamide gel by N' N' – methylene bisacrylamide.
- 5 Explain principal of affinity chromatography with its working.
- 6 Discuss protein separation by ion exchange chromatography.
- 7 explain formula to calculate total bed volume
- 8 Write on detectors used for u.v spectrometer.
- 9 Enlist gradients in centrifuge and its specificity in separation of any three biomolecules.
- 10 Explain sedimentation velocity.
- 11 why popping – up process for sample is important before loading in SDS gel.
- 12 Explain – swingout rotors

**Q-3 Long questions:**

**40**

- 3 -1 Draw diagram & explain in detail - Photo multiplier tube. 5
  - 2 Explain types of monochromators 5
- OR**
- 3 -1 Classify and write on importance for each type of IR 6
  - 2 Discuss radiant energy source used for various types of spectrometric analysis. 4
  - 4 -1 Explain- principle and write on method to separate protein fraction using agarosegel . 6
  - 2 Write note on 2-D Electrophoresis. 4
- OR**
- 4 -1 Explain principle and basic method for IEF. 6
  - 2 Explain preparation of various gels. 4
  - 5 -1 Differentiate between HPLC and GLC. 5
  - 2 Write account on HIC 5
- OR**
- 5 -1 Explain- types of ion exchangers and write on process with any one example. 6
  - 2 Explain principal and elution in affinity chromatography. 4
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- 6 -1 Draw a diagram for analytical Ultracentrifuge and explain it's working and application. 10
- OR**
- 6 -1 Derive equation for sedimentation rate of spherical particle. 10

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