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SEAT No. \_\_\_\_\_

No. of Printed Pages: 02

## Sardar Patel University

M. Sc. Int. Biotechnology, Fifth Semester Examination

Wednesday, 2<sup>nd</sup> May, 2018

10:00 a.m. – 01:00 p.m.

PS05CIGB05: Bioinstrumentation

Note:

Max. Marks 70

1. Figures to the right indicate marks.
2. Draw neat and labeled diagram, wherever necessary.

Q-1 Attempt the followings

[01 X 08 = 08]

1. Which of the following the formula for pH calculation  
a)  $\log_{10}[H^+]$       b)  $-\log_{10}[H^+]$       c)  $\log_{100}[H^+]$       d)  $-\log_{10}[H^+]$
2. Which of the following separation method is suited for a protein sample with large differences in molecular mass?  
a) Dialysis      b) Salting out process  
c) Density gradient centrifugation      d) Rate zonal centrifugation
3. What is the magnification of microscope when the power of ocular lens is 10X and objective lens is 40 x?  
a) 4 times      b) 30 times      c) 50 times      d) 400 times
4. Which of the following is used to visualized the live cells?  
a) SEM      b) TEM      c) Phase contrast microscope      d) All
5. Chromatography is used to separate \_\_\_\_\_.  
a) Solution      b) Mixtures      c) Molecules      d) Atoms
6. Components which have small value of K have affinity for \_\_\_\_\_.  
a) Stationary phase      b) Mobile phase      c) No phase      d) Solution
7. \_\_\_\_\_ developed the he separation of charged molecules in electrophoresis.  
a) Svedberg      b) Tiselius      c) Sanger      d) Tswett
8. Speed of migration of ions in an electric field depends on which of the following?  
a) Magnitude of charge and mass of molecules  
b) Magnitude of charge and shape of molecules  
c) Magnitude of charge, shape and mass of molecule  
d) Shape and size of the molecule

Q-2 Answer the following questions (Any seven)

[02 X 07 = 14]

- i. What are the factors affecting pH measurement?
- ii. Write application of Centrifuges.
- iii. Give difference between SEM and TEM.
- iv. What is the function of phase plate?
- v. What is Stoke's shift?
- vi. Explain principle of chromatography.
- vii. Write application of Gas chromatography.
- viii. Differentiate between Native-PAGE and SDS-PAGE
- ix. What is pI?

- Q-3 A) Enlist and explain in brief methods of determining pH. [06]  
B) Explain the different types of rotors used in centrifuge. [06]

OR

- B) Calculate centrifugal acceleration (g value) of a centrifuge tube in a swing-out rotor of a bench centrifuge operating at 3000 r.p.m. are 70 mm, 80 mm and 95 mm respectively. [06]
- Q-4 A) Explain the principle, technique and applications of flow cytometry in detail. [06]  
B) Explain the instrumentation of Surface Electron Microscope. [06]

OR

- B) Discuss principal and working of Phase contrast Microscope [06]
- Q5 A) Explain working and application of gel filtration. [06]  
B) Write a detail note on any one Detector used in GC. [06]

OR

- B) Write principle and application of ion exchange chromatography. [06]
- Q6 A) Describe the principle, method and applications of agarose gel electrophoresis. [06]  
B) Which molecules can be separated by IEF? Explain its principle and technique in detail. [06]

OR

- B) Explain the use of Polyacrylamide gel as supporting media in electrophoresis [06]

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