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Sardar Patel University
M. Sc. Genetics, First Semester Examination
Monday, 24th October, 2016
10:00 a.m. – 01:00 p.m.

PS01CGEN03: Bioanalytical Techniques

Note:

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

Total Marks: 70

Q-1 Attempt the followings

[08 X 01 = 08]

1. What is the total magnification achieved with a compound microscope?
 - a) Magnification of objective lens
 - b) Magnification of ocular lens
 - c) Magnification of ocular lens added to the magnification of the objective lens
 - d) Magnification of ocular lens multiplied by the magnification of the objective lens
2. Which microscope is used to observe a specimen that emits light when illuminated with an ultraviolet light?
 - a) Phase-contrast microscope
 - b) Compound light microscope
 - c) Fluorescence microscope
 - d) Electron microscope
3. Pattern on paper in chromatography is called
 - a) Chroming
 - b) Chroma
 - c) Chromatograph
 - d) Chromatogram
4. In normal phase HPLC, there is a
 - a) Non polar solvent/polar column
 - b) Polar solvent/non-polar column
 - c) Non polar solvent/non-polar column
 - d) All
5. Particles suspended in a liquid will move at a rate that depends on
 - a) The density of the particles and the liquid
 - b) Applied force
 - c) The size and shape of the particles
 - d) All
6. pH of resolving gel is
 - a) 6.8
 - b) 7.6
 - c) 8.8
 - d) 9.8
7. Standard path-length in UV/Vis spectrophotometer is usually
 - a) 15 cm
 - b) 11 cm
 - c) 12 cm
 - d) 1 cm
8. AAS is used to determine _____ concentration in a sample
 - a) Metal element
 - b) Non-metal element
 - c) Functional group
 - d) all

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

[07 X 02 = 14]

1. Give the comparison of bright field and dark field microscopy.
2. Define chromatography.
3. What is IEF?
4. Define numerical aperture in microscopy.
5. Enlist the type of rotor used in centrifugation.
6. What is meant by reverse phase chromatography?
7. Briefly discuss the process of photopolymerization.
8. Explain the uses of electrophoresis.
9. Explain the radiation source used in IR.

- Q-3 (A) Explain different parts of optical microscope and their function. [06]
(B) Write a short notes on image formation in confocal microscopy. [06]
- OR**
- (B) Give a brief introduction and principle involved in scanning electron microscopy. [06]
- Q-4 (A) Schematically explain the working of HPLC. [06]
(B) Describe the construction and working of quadrupole in mass spectroscopy. [06]
- OR**
- (B) Explain at least two popular detectors used in GC. [06]
- Q5 (A) Discuss the various factors influencing electrophoretic separation of molecules in poly-acrylamide gel. [06]
(B) Describe the principle, method and applications of agarose gel electrophoresis. [06]
- OR**
- (B) Explain the principle of centrifugation and give the derivation of sedimentation of spherical particle. [06]
- Q6 (A) Calculate the centrifugal acceleration (RCF, i.e. the g value) of an ultracentrifuge with an r_{av} of 95 mm, operating at 3000 r.p.m. [06]
(B) State the Beer-lambert law. What is its importance [06]
- OR**
- (B) Describe the different modes of vibrations in IR spectroscopy [06]

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