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SAR DAR PATEL UNIVERSITY
EXTERNAL EXAMINATION
Tuesday- DAY, DATE - 12/11/13
TIME- 10:30-1:30 p.m. Course: US05CGEN-01
SUBJECT: Instrumental Methods of Analysis

CLASS- T.Y.B.Sc

SEMESTER-V

MAX. MARKS- 70

Q1- Select the correct from the following Multiple Choice: [1 X 10]

[10]

1) Which wave has wavelength greater than visible light
a) Infra red b) X rays c) UV rays d) none.

2) - Unpolarized light can be converted into polarized by
a) Nicol prism b) silver mirror c) Water d) lens

3) Which of the following is NOT equivalent to 10 micrometers.
a) 0.0001 cm b) 0.01 mm c) 10,000 nm d) 100,000 angstrom

4) Nanograph is used for determination of
a) Angular velocity b) colour c) RCF d) density

5) Living, unstained cells and organisms can be observed best using
a) fluorescent microscopy b) TEM c) phase contrast microscopy d) SEM

6) 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. any of the above

7) Nucleic acid can be separated on.....
a) Silica gel Chromatography b) SDS-PAGE c) Agarose Gels d) Polythelene Gels

8) Agarose is
a) Synthetic molecule b) Extracted from red algae c) Extracted from Fungus
d) Extracted from bacteria.

9) Electrophoresis of histones (pI - 8.5) and myoglobin (pI - 5.5) under non-denaturing conditions (pH - 7.0) results in:

- a) histones migrate to the cathode (-); myoglobin migrates to the anode (+)
- b) histones migrate to the anode (+); myoglobin migrates to the cathode(-).
- c) both proteins migrate to the anode (+).
- d) both proteins migrate to the cathode (-).

10) Large DNA (e.g., yeast chromosomes) is easily separated using
a) PAGE b) PFGE c) isoelectric focussing d) agarose.

[P.T.O]

Q2— Answer the Short Questions: (attempt any TEN) [20]

- 1) What is the use of ethidium bromide in electrophoresis?
- 2) How polymerization occur in SDS PAGE ?
- 3) If the velocity of light is 3×10^8 m/s and wavelength is 400 nm, find the frequency of the light?
- 4) Why filters are required in fluorescent microscope ?
- 5) What is the applied centrifugal force at a point equivalent to 5 cm from centre of rotation and an angular velocity of 3000 rad/s?
- 6) Differentiate Rate Zonal and Isopycnic centrifugation.
- 7) How molecules of different size separated by gel exclusion chromatography?
- 8) What is R_F value?
- 9) Why two different phases (stationary phase and mobile phase) are used in Chromatography?
- 10) Differentiate TEM and SEM.
- 11) What type of lens is used in electron microscope?
- 12) Why agarose plugs are used in PFGE?

Q3 Explain agarose gel electrophoresis in detail. [10]

OR

Q3 (a) What are the important features of capillary electrophoresis? [5+5]

Q3 (b) How chromosomes are separated in PFGE?

Q4 Differentiate the working of compound microscope, electron microscope, fluorescent microscope. [10]

OR

Q4 (a) Explain in detail the important features of phase contrast microscope. [5+5]

Q4 (b) Explain in brief the different properties of light.

Q5 Discuss the principle, instrument and applications of Spectrophotometer. [10]

OR

Q5 (a) Elaborate the type and importance of different type of rotors [5+5]

(b) Explain the principle and types of Centrifuge

Q6 What is Chromatography? Explain any two methods in detail. [10]

OR

Q6 Write a short note on

a) Gas Liquid chromatography b) Affinity chromatography [5+5]
