

ST. JOSEPH'S COLLEGE (AUTONOMOUS), BANGALORE-27

MID SEMESTER TEST: AUGUST 2019

B.Sc. BIOTECHNOLOGY- V SEMESTER

BT 5215: Genetic Engineering, Biophysics, Bioinformatics and Entrepreneurship

Time : 1 Hour

Max Marks : 30

Section A

I. Answer any ONE of the following questions.

1x4=4

1. Answer these questions related to spectroscopy:
 - a. Why do sigma bonding orbitals absorb shorter wavelength EM waves than pi bonding orbitals?
 - b. Which of the following chemical food dyes will absorb more light of longer wavelengths? Why?

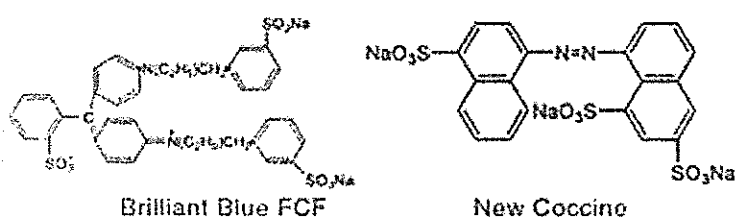


Fig. 3 Structures of New Coccine and Brilliant Blue FCF

2. Explain what is 2d chromatography in brief. When does one use it?

II. Answer any ONE of the following questions

1x4=4

3. Imagine you have spotted a chemical extract from the *Vinca rosea* plant on a TLC plate and used a non-polar solvent to separate the compounds. However, to your surprise, you see no visible spots on the plate. Can you describe some possible next steps with the underlying principle of each?

4. Briefly explain the differences between column chromatography and TLC. How will you separate a protein that binds to the TATA box (e.g. RNA polymerase) from a mixture of other proteins? Explain using a brief diagram.

III. Answer any ONE of the following.

1x8=8

5. Describe the key steps of genome sequencing with the help of appropriate diagrams. Write a special note on dideoxynTPs along with the appropriate step.
6. Questions about radioactivity:
 - a. List the different types of radioactive decay products.
 - b. Write a note on radioactive half-life. As an example, draw a properly labeled graph for decay of ¹⁴C isotope.
 - c. Describe 2 major applications of radioactivity in biology or medicine.

Section B

I. Answer any TWO of the following questions.

3x2=6

1. How is Silicon Carbide fibers used as a DNA Transformation method?
2. Explain with an example the nomenclature involved in naming Restriction endonucleases.
3. Discuss a few ethical issues that Recombinant DNA technology is often associated with.

II. Answer the following question.

1x8=8

4. Discuss value propositions and key partners for a business venture that involves a company making lab waste containers or bins.