STELLA MARIS COLLEGE (AUTONOMOUS) CHENNAI 600 086
(For candidates admitted during the academic year 2023 – 2024)

M. Sc. DEGREE EXAMINATION - NOVEMBER 2023
BIOTECHNOLOGY
FIRST SEMESTER

COURSE : ELECTIVE
PAPER : BIOINSTRUMENTATION
SUBJECT CODE : 23BY/PE/BI15
TIME : 3 HOURS **MAX. MARKS: 100**

Q. No.	SECTION A Answer ALL Questions (10 x 1 = 10 marks)	CO	KL
1	Recall the fingerprint region in FTIR.	1	1
2	Write the wavelength of the UV region.	1	1
3	Expand FACS.	1	1
4	List the purpose of a DNA sequencer.	1	1
5	Define analytical ultracentrifugation.	1	1
6	Identify the stationary phase in Gas chromatography.	1	1
7	Define DGGE.	1	1
8	Name the dye used to visualize DNA in agarose gel electrophoresis.	1	1
9	Describe the SI unit of radioactivity.	1	1
10	Tell about spray dryer.	1	1
Q. No.	**SECTION – B** **Answer ALL Questions (5 x 2 = 10 marks)**	**CO**	**KL**
11	Summarize the components of confocal microscopy.	2	2
12	Discuss the different types of biosensors.	2	2
13	Illustrate a cation exchanger.	2	2
14	Explain the applications of microchip electrophoresis.	2	2
15	Indicate two radioisotopes used in medicine.	2	2
Q. No.	**SECTION C** **Answer ALL Questions (4 x 10 = 40 marks)**	**CO**	**KL**
16a 16b	Demonstrate the principle and applications of Cryomicroscopy. **(or)** Present the steps in Mass Spectrometry.	3	3
17a 17b	Predict how a PCR experiment can detect the presence of a specific DNA sequence in a given sample. **(or)** Compute the steps involved in a Kjeldahl nitrogen determination.	3	3
18a 18b	Outline the principle and instrumentation of HPLC. **(or)** Investigate the principle and applications of 2D PAGE.	4	4
19a 19b	Outline what is scintillation? How is this property used to measure radioactivity in biological fluids? **(or)** Organize the concept of lyophilization and briefly discuss its types.	4	4

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Q. No.	SECTION – D Answer ALL Questions (2 x 20 = 40 marks)	CO	KL
20a	Convince how NMR Spectroscopy can be used to determine the structure of an organic compounds.	4	5
	(or)		
20b	Evaluate how a DNA microarray experiment to identify specific gene expression pattern in a cancer cell.		
21a	Generate the steps involved in the separation of compound by gas chromatography? Explain with suitable illustrations.	5	6
	(or)		
21b	Propose how will you separate Proteins based on their molecular weight? Will you use native PAGE or SDS PAGE? Why?		

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