Reg. No										

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GANDHI INSTITUTE OF ENGINEERING AND TECHNOLOGY UNIVERSITY, ODISHA, GUNUPUR
(GIET UNIVERSITY)

M. Sc. (Third Semester) Regular Examinations, December– 2024

22BTPC302– Emerging Technologies

(M.Sc. Biotechnology)

Time: 3 hrs | Maximum: 60 Marks

(The figures in the right hand margin indicate marks.)

PART – A **(2 x 10 = 20 Marks)**

Q.1. Answer ***ALL*** questions	CO #	Blooms Level
a. Write the principle of cryo electron microscopy.	CO1	K1
b. List two types of electromagnetic lenses in the SEM and their functions.	CO1	K2
c. Define chromophore. Give examples.	CO1	K1
d. Which part of the light microscope controls the intensity of light entering the viewing area?	CO2	K3
e. Explain the role of reagent gasses in chemical ionization. Give example of reagent gas.	CO2	K3
f. State Köhler illumination.	CO2	K1
g. What is the role of gRNA in CRISPR mediated gene editing.	CO4	K3
h. Why different elements show unique sets of diffraction peaks?	CO3	K4
i. Define chemical shift.	CO3	K1
j. Give the molecular formula of hydrocarbon cation with an m/z value of 91.	CO2	K5

PART – B **(10 x 5 = 50 Marks)**

Answer ***ANY FIVE*** questions	Marks	CO #	Blooms Level
2. a. Discuss about the different light sources used in confocal microscopy.	5	CO2	K3
b. Write short notes on Dichroic mirror and excitation filter.	5	CO1	K2
3.a. What is fluorescence photobleaching? Describe briefly.	4	CO2	K1
b. Add a note on image formation in compound microscope.	6	CO1	K2
4. a. Describe the application and advantages of Nano LC-MS.	5	CO2	K3
b. Explain the principle and application of imaging MS.	5	CO2	K3
5.a. Explain the working principle and application of liquid state NMR.	5	CO3	K3
b. Write the principle and application of small angle X-ray scattering?	5	CO3	K3
6. a. Describe the principle behind Dark field microscopy with ray diagram.	5	CO1	K3
b. Give the construction and working principle of Time of Flight Mass analyser.	5	CO2	K4
7.a. Discuss about the machinery involved in CRISPER assisted gene editing.	5	CO4	K4
b. Write note on application of CRISPR mediated gene editing.	5	CO4	K2

8. a.	Explain diagrammatically the difference between nanobodies and antibodies.	5	CO4	K2
b.	Illustrate stepwise development of antibody by phage display method with diagram.	5	CO4	K3