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**GIET UNIVERSITY, GUNUPUR – 765022**  
M. Sc. (Third Semester) Examinations, December – 2022  
**20BTPC302 – Emerging Technologies**  
(Biotechnology)

Time: 3 hrs

Maximum: 70 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 on the electromagnetic lenses of SEM?	CO 1	K1
b. What are the functions of aperture disc?	CO 1	K1
c. Explain on fixation of biological samples for microscopic study?	CO 1	K1
d. What do you mean by resolution?	CO 2	K1
e. Differentiate between pixel and voxel?	CO 2	K2
f. Illustrate the part of the light microscope controls the intensity of light?	CO 2	K2
g. Write the angle of X-ray scattering?	CO 3	K2
h. What are nanobodies?	CO 3	K3
i. Write four applications of spectroscopy?	CO 4	K2
j. What do you mean by special sampling?	CO 4	K1

**PART – B****(10 x 5 = 50 Marks)**Answer ANY FIVE questions

	Marks	CO #	Blooms Level
2. a. Analyse the principle and instrumentation of atomic force microscopy?	7	CO 1	K1
b. Write in details on application of AFM?	3	CO 1	K1
3.a. Describe the principle and structure of two photon fluorescence?	7	CO 1	K2
b. Explain the application of two photon fluorescence?	3	CO 1	K1
4. a. What is fluorescence photobleaching? Describe briefly?	5	CO 2	K2
b. Differentiate between Dark field and bright field microscopy?	5	CO 2	K1
5.a. What is chemical shift? Elaborate the factors influence on chemical shift?	5	CO 2	K1
b. Illustrate on instrumentation of X-ray diffraction (XRD)?	5	CO 2	K2
6. a. Describe in details about Nano LC-MS?	7	CO 3	K2
b. What are the biotechnological application Nano LC-MS?	5	CO 3	K3
7.a. Elaborate fragmentation process in mass spectroscopy?	5	CO 3	K2
b. Write on the applications of small angle X-ray scattering?	5	CO 4	K1
8. a. Discuss the mechanism of CRISPER/cas9 mediated gene editing?	7	CO 4	K3
b. What are the application of CRISPER/cas9 mediated gene editing?	3	CO 4	K2

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