

G. S. Mandal's

Maharashtra Institute of Technology, Aurangabad

(An Autonomous Institute)

END SEMESTER EXAMINATION

First Year B.Tech (All) -April/May 2022

Course Code : BSC102

Duration : 2 Hrs

Course Name : Open Elective – Engg. Physics

Max. Marks : 50

Date : 13/04/2022

Instructions :

- i) All questions are compulsory
- ii) Assume suitable data wherever necessary and clearly state it
- iii) Figures to the right indicate full marks

Q. 1	Solve/Answer any five	10 Marks		
	Questions	Marks	CO	BL
a	State the characteristics of electromagnetic waves.	2	1	1
b	Define nuclear fusion.	2	1	1
c	State the formula for crystal structure.	2	1	1
d	What is the formula relating wavelength to the momentum as per the de Broglie hypothesis?	2	1	1
e	State any two properties of nanomaterial.	2	1	1
f	Label the parts by drawing nuclear reactor.	2	1	1
Q. 2	Solve the following questions	8 Marks		
a)	Solve for calculating specific rotation of the given sample of sugar solution if the plane of polarization is turned through 13.2° . The length of tube containing 10 % sugar solution is 20cm	4	3	3
b)	A beam of X-rays of wavelength 0.071 nm is diffracted by rock salt in which the atomic planes are 1.979 Å apart. Find the glancing angle for the second-order diffraction.	4	3	3
Q. 3	Solve the following questions	8 Marks		
a)	In an auditorium of dimensions length 12 m, breadth 10 m and height 8 m, what will be the change in the reverberation time for	4	3	3

	the auditorium hall with no audience and full capacity of audience (100 persons) if the total absorption of the hall is 181.2 and absorption per person is assumed to be 0.46 / person.			
b)	Apply the step index fiber having the numerical aperture 0.26 and refractive index of core 1.5 by finding the values of cladding and acceptance angle.	4	3	3
Q. 4 Solve the following questions 8 Marks				
a	Explain Miller indices notation for atomic planes.	4	2	2
b	Summarize the liquid drop model for nucleus formation.	4	2	2
Q. 5				
	Analyze the role of interference of light in Newton's ring experiment.	8	4	4
OR				
Q. 5	Analyze the methods of production of ultrasonic waves.	8	4	4
Q. 6				
	Make inference about the experimental observations of superconductivity.	8	4	4
OR				
Q. 6	Compare the features of ruby laser with those of semiconductor laser	8	4	4