	DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE **Winter Examination – 2022** **Course: B. Tech. Branch : All Semester : I** **Subject Code & Name: Engineering Physics (BTBS102P)** **Max Marks: 60 Date:23/03/23 Duration: 3 Hr.**		
	Instructions to the Students: *1. All the questions are compulsory.* *2. The level of question/expected answer as per OBE or the Course Outcome (CO) on which the question is based is mentioned in ( ) in front of the question.* *3. Use of non-programmable scientific calculators is allowed.* *4. Assume suitable data wherever necessary and mention it clearly.*		
		(Level/CO)	Marks
Q. 1	**Solve Any Two of the following.**		**12**
A)	**Describe the construction and working for producing ultrasonic waves using magnetostriction method.**	**CO1**	**6**
B)	**Define free oscillation. Set up a differential equation for free oscillations and find it's solution.**	**CO1**	**6**
C)	**Define ultrasonic waves. List their applications in various fields. Give the details of any one application with labeled diagram.**	**CO1**	**6**
Q.2	**Solve Any Two of the following.**		**12**
A)	**Derive an expression for darkness due to reflected light for thin film interference.**	**CO2**	**6**
B)	**Explain the production of polarization due to birefringence (Double refraction) with neat diagram.**	**CO2**	**6**
C)	**Explain the construction and working of He-Ne laser with neat and labeled diagram.**	**CO2**	**6**
Q. 3	**Solve Any Two of the following.**		**12**
A)	**Derive Schrodinger's time independent wave equation.**	**CO3**	**6**
B)	**With neat diagram, explain the construction & working of Geiger-Muller Counter.**	**CO3**	**6**
C)	**Explain with neat diagram, how isotopes can be separated with the help of Bainbridge mass spectrograph.**	**CO3**	**6**
Q.4	**Solve the following.**		**12**
A)	**Describe the production of characteristic X-rays.** **Calculate the minimum wavelength of X-rays, if the X-ray is operated**	**CO4**	**6**

	at 20 kV.		
B)	**Calculate the relation between atomic radius and lattice constant for BCC and FCC.**	**CO4**	**6**
Q. 5	**Solve Any Two of the following.**		**12**
A)	**Differentiate between conductor, semiconductor and insulator on the basis of energy band diagram and discuss their properties.**		**6**
B)	**Explain Meissner effect in superconductors. State any two applications of superconductors.**		**6**
C)	**Explain B-H curve for ferromagnetic materials. Write the significance of B-H curve.**		**6**
	***** End *****		