DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2022

Course: B. Tech. **Branch: All branches (Group B)** **Semester: II**

Subject Code & Name: BTBSP202 Engineering Physics

Max Marks: 60 **Date:20/08/2022** **Duration: 3.45 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.**		
A)	In case of Forced vibrations, prove that $A = \frac{f}{\sqrt{(\omega^2 - p^2)^2 + 4b^2p^2}}$	(CO1) (Understand)	6
B)	Explain the construction and working for production of ultrasonic waves using Piezoelectric Oscillator.	(CO1) (Understand)	6
C)	Write any two applications of ultrasonic waves. Calculate the thickness of quartz plate which is used to produce ultrasonic waves of 2 MHz. Density of quartz is 2.65 X 10^3 kg/m^3 and Young's modulus is 8 X 10^{10} N/m^2	(CO1) (Remember & Understand)	6
Q.2	**Solve Any Two of the following.**		
A)	Derive an expression for diameter of Newton's bright and dark rings.	(CO2) (Understand)	6
B)	Explain the construction and working of Ruby Laser.	(CO2) (Understand)	6
C)	State and explain Brewster's law. With a slab of flint glass, the angle of polarization is found to be $62^0\ 24'$ Calculate the refractive index of the flint glass.	(CO2) (Remember & Understand)	6
Q. 3	**Solve Any Two of the following.**		
A)	With neat diagram, explain the construction and working of Bainbridge Mass Spectrograph.	(CO3) (Understand)	6
B)	Explain the construction and working of Geiger Muller Counter.	(CO3) (Understand)	6
C)	Derive Schrodinger's time independent wave equation.	(CO3) (Understand)	6
Q.4	**Solve the following questions.**		
A)	Calculate atomic radii in SC, BCC and FCC lattices with suitable diagrams.	(CO4) (Understand)	6
B)	Explain characteristics and continuous X-ray spectra.	(CO4) (Understand)	6
Q. 5	**Solve Any Two of the following.**		
A)	Explain B-H curve for ferromagnetic materials. Define the terms Coercivity and Retentivity.	(Understand)	6
B)	Distinguish between Type I and Type II superconductors.	(Understand)	6
C)	What is Hall effect? Derive an expression for Hall Voltage and Hall Coefficient.	(Remember) & (Understand)	6

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