

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 $2.65 \times 10^3 \text{ kg/m}^3$ and Young's modulus is $8 \times 10^{10} \text{ N/m}^2$	(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 $62^\circ 24'$. 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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