DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

Regular End Semester Examination – Summer 2023

Course: B. Tech.   **Branch: All**   **Semester: II**

Subject Code & Name: BTBS202P   (Engineering Physics)

Max Marks: 60   **Date:14/07/2023**   **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.**		
A)	Define Damped Vibrations. Set up differential equation for damped vibrations.	(CO1) (Remember & Understand)	6
B)	Explain the construction, working for production of ultrasonic waves using Piezoelectric oscillator.	(CO1) (Understand)	6
C)	State any two applications of ultrasonic waves. Calculate the length of iron rod which can be used to produce ultrasonic waves of 20 KHz. Density of iron is 7.23×10^3 kg/m^3, Young's modulus is 11.6×10^{10} N/m^2	(CO1) (Remember & Understand)	6
Q.2	**Solve Any Two of the following.**		
A)	In Newton's rings, derive an expression for diameter of nth bright ring and dark ring.	(CO2) (Understand)	6
B)	Explain the construction & working of Ruby laser.	(CO2) (Understand)	6
C)	Explain the structure of optical fiber with suitable diagram. Calculate the numerical aperture of a optical fiber with core index n_1=1.61 and cladding index n_2=1.55	(CO2) (Remember & Understand)	6
Q. 3	**Solve Any Two of the following.**		
A)	With neat diagram, explain the construction & working of Bainbridge mass spectrograph.	(CO3) (Understand)	6
B)	Write short note on Geiger Muller Counter.	(CO3) (Understand)	6
C)	State Heisenberg's Uncertainty Principle with formula.	(CO3)	6

If the uncertainty in position of an electron is 4×10^{-10} m, Calculate the uncertainty in its momentum. (h=6.62 $*10^{-34}$ J Sec)   (Understand)

Q.4   Solve the following questions.

A)   Calculate Atomic Packing Fraction for SC, BCC and FCC lattices.   (CO4)
(Understand)   6

B)   Explain Continuous X-ray spectra.

Calculate the wavelength of X-rays when a potential difference of 30 KV   (CO4)
is applied between filament and anode.   (Understand)   6

Q. 5   Solve Any Two of the following.

A)   Explain Diamagnetic, Paramagnetic and Ferromagnetic materials with examples and diagram.   (Understand)   6

B)   Distinguish between Type I and Type II superconductors.   (Understand)   6

C)   Derive an expression for conductivity of Intrinsic and extrinsic (P Type & N Type) Semiconductors.   (Understand)   6

*** End ***