DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

End Semester Examination – Winter 2019

Course: B. Tech	Sem: 1
Subject: Engineering Physics (PHY1202)	Marks: 60M
Date: 13/12/2019	Duration: 3 Hr.

Instructions to the Students:
1. *All the questions are compulsory.*
2. *The level 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)	What are forced oscillations? Obtain the differential equation of forced oscillations.	(Synthesis)	06
B)	Explain the production of ultrasonic waves using magnetostriction effect. Calculate the length of Ni rod needed to produce ultrasonic waves of frequency 40 KHz. Density of rod is 8.9 gm/cm^3 and Young's modulus of rod is 20.8 X 10^{10} N/m^2.	(Knowledge /Remember)	06
C)	Explain the effect of frequency and temperature on polarization in dielectric.	(Knowledge /Remember)	06
Q.2	**Solve Any Two of the following.**		
A)	Prove that in Newton's Rings by reflected light, the diameters of bright rings are proportional to square root of odd natural numbers.	(Evaluation)	06
B)	Explain the construction and working of Ruby laser with neat diagram.	(Comprehension/Understand)	06
C)	Define acceptance angle and numerical aperture. Refractive index of core is 1.48 and that of cladding is 1.47 in an optical fiber. Calculate critical angle, numerical aperture and acceptance angle.	(Analysis)	06
Q. 3	**Solve Any Two of the following.**		
A)	Explain the principle and working of Bainbridge Mass Spectrograph with neat diagram.	(Comprehension/Understand)	06

B)	What is uncertainty principle? Using this principle prove that electron cannot exist in the nucleus.	(Synthesis)	06
C)	Explain the construction and working of G.M. counter.	(Comprehension/ Understand)	06
Q.4	**Solve Any Two of the following.**		
A)	Show that shortest wavelength of continuous X-rays is inversely proportional to the potential difference applied.	(Synthesis)	06
B)	Derive the relation between lattice constant and density of the cubic crystal. Copper has FCC structure and its atomic radius is 1.278×10^{-10}m. Calculate density of Cu. Given atomic weight of Cu = 63.5.	(Application)	06
C)	Derive an expression for electromagnetic wave in free space and hence calculate the velocity of light in free space.	(Synthesis)	06
Q. 5	**Solve the following.**		
A)	Differentiate Type I and Type II superconductors.	(Application)	06
B)	What is Hall effect? Derive an expression for Hall voltage and Hall coefficient.	(Analysis)	06
	***Paper End ***		