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DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE

End Semester Examination – Summer 2019

Course: B. Tech **Sem: I & II**

Subject Name: Engineering Physics **Subject Code: PHY120**

Max Marks: 60 **Date:15/05/2019** **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)	Which are the forces acting in the Damped Oscillations? Obtain the differential equation of Damped Oscillations.	(CO1)	06
B)	Discuss the effect of temperature and frequency dependence on polarization in dielectrics.	(CO6)	06
C)	What is piezoelectric effect? Describe piezoelectric method for generating ultrasonic waves.	(CO1)	06
Q.2	**Solve Any Two of the following**		
A)	Prove that for Newton's rings in reflected light, the diameter of dark ring is proportional to the square root of natural numbers.	(CO2)	06
B)	Explain construction and working of Ruby laser with neat diagram.	(CO2)	06
C)	Obtain mathematical expression for acceptance angle and numerical aperture.	(CO2)	06
Q. 3	**Solve Any Two of the following**		
A)	Explain with diagram principle and working of Bainbridge mass spectrograph.	(CO3)	06
B)	i) Show that electron does not exists inside the nucleus, with the help of Heisenberg's uncertainty principle.	(CO3)	03
	ii) A bullet of mass 0.05 kg is moving with a velocity of 800 m/s, the speed of bullet measured an accuracy of 0.01%. Calculate the accuracy with which the position of a bullet can be located.		03
C)	Derive Schrodinger's time dependent wave equation.	(CO3)	06
Q.4	**Solve Any Two of the following.**		
A)	Define primitive and non-primitive unit cells. Calculate the lattice constant of iron which has BCC structure. Given ρ= 7.86gm/cc M=55.85	(CO4)	06
B)	Explain continuous X-ray spectrum with neat diagram. An X-ray is operated at 18 kV. Calculate the minimum velocity of electron bombarded at the anode.	(CO4)	06

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C)	What is displacement current? Write Maxwell's equations in integral and differential form.	(CO3)	06
Q. 5	**Solve the following.**		
A)	i. Write formula of Ferrites and Garnets.	(CO5)	06
	ii. Explain Meissner effect in superconductors.	(CO6)	
B)	What is Hall Effect? Derive an expression for Hall voltage V_H and Hall coefficient R_H.	(CO5)	06

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