DR. BABASAHEB AMBEDKAR TECHNOLOGICAL UNIVERSITY, LONERE.
End Semester Examination (Supplementary)

Course: F. Y. B. Tech **Sem. I &II**
Subject Name: Engineering Physics **Subject Code**: PHY103/203
Max. Marks: 60 **Date**: **03/06/2019** **Duration**: 3 Hrs.

Instructions to the Students:
1. Each question carrries 12 marks.
2. Attempt any five questions of the following.
3. Illustrate your answer with neat sketches, diagrams, etc. Wherever necessary.
4. If some part or parameter is noticed to be missing, you may appropriately assume it and mention it clearly.

Q. No.		Questions	Marks
Q. No. 1	**Attempt the following.**		
	A	State the Condition of resonance. With the help of figure explain the sharpness of resonance.	6
	B	Explain Piezoelectric and Magnetostriction Effect. Calculate the fundamental frequency of quartz crystal of 1mm thick having density 2650 kg/m^3. Given Y= 8 X 10^8 N/m^2.	6
Q. No. 2	**Attempt any two of the following.**		
	A	Discuss the interference of light in thin film due to reflected ray.	6
	B	What is angle of polarization? State and prove Brewster's Law.	6
	C	Differentiate between spontaneous and stimulated emission of radiation. Calculate the numerical aperture of an optical fibre whose core and cladding are made of materials with referactive index 1.6 and 1.5 respectively.	6
Q. No. 3	**Attempt the following**		
	A	What is Heisenberg's Uncertainty Principle? Using this prove that electron cannot exist in the nucleus.	6
	B	Derive time dependent Schrodinger's wave equation.	6
Q. No. 4	**Attempt the following**		
	A	Derive the relation between lattice constant 'a' and density 'ρ' of the cubic crystal. Calculate the number of atoms per cell for a metal with lattice parameter 2.9 Å. Given : M=55.385 ρ = 7.87 gm/cm^3	6
		OR	
	A	Explain different type of lattices in cubic system. Find the packing density for SC, BCC and FCC lattices	6
	B	State and prove Moseley's Law.	6

Q.5 Attempt the following

A Explain ferrimagnetic material with examples. 6
A magnetic field of 1000 A/m produces a magnetic flux of 2×10^{-5} Wb in a bar of iron of 0.2 cm^2 cross section. Calculate permeability and succeptibility of bar.

OR

A Derive an expression for resistivity of conducting materials in terms of relaxation time of an electron. 6

B What is superconductivity? Explain Type-I and Type-II superconductors. 6

Q.6. Attempt any two of the following

A Derive relation for conductivity of intrinsic and extrinsic semiconductors. 6

B Explain various types of polarization in dielectric materials. 6

C Derive an expression for electromagnetic wave in free space. 6

END