

M.Phil/Pre Ph.D Regular & Supplementary Examinations – OCTOBER, 2023
R211103
Paper –III: ADVANCED PHYSICS.
Physics

Time : 3 hrs

Maximum Marks : 100

Answer One Question from Each Unit
All Questions Carry Equal Marks

		UNIT - I	Marks
1	(a)	Find the roots of the equation $3x - \cos x - 1 = 0$ by Newton – Raphson method and write its algorithm.	10 M
	(b)	Describe the Bisection method to evaluate the roots of an equation.	10 M
OR			
2	(a)	Derive Newton’s Backward difference interpolation formula.	10 M
	(b)	Give the theory of Simpson’s 1/3 rule.	10 M
UNIT - II			
3	(a)	Discuss Top – down and Bottom – up approaches in nano-technology.	10 M
	(b)	Write the chemical and optical properties of nano-materials.	10 M
OR			
4	(a)	Discuss the synthesis of nano-materials by Ball Milling method.	10 M
	(b)	Explain the applications of nano-technology in Electronics, Diagnosis, Novel drugs and Computers.	10 M
UNIT - III			
5	(a)	Describe the production of Ultrasonic waves by Magneto Striction method.	10 M
	(b)	Discuss briefly on the measurement of Ultrasonic velocity.	10 M
OR			
6	(a)	Explain the applications of Ultrasonics in flow detection, thickness gauging and Cavitation.	10 M
	(b)	Discuss how Ultrasonics are applied in Emulsification, Ultrasonic welding, Medical field and in Ultrasonic cleaning.	10 M
UNIT - IV			
7	(a)	Explain Glass transition temperature. Describe the importance of Enthalpy Verses Temperature diagram of a Melt.	10 M
	(b)	Write about batch materials of Glass and explain batch calculation.	10 M
OR			
8	(a)	Explain the Zachariasen rules of Glass forming systems.	10 M
	(b)	Discuss the Electronic applications, Optical applications and Magnetic applications of Glass.	10 M
UNIT - V			
9	(a)	Explain the Chemical constitution of liquid crystals. Discuss Lyotropic, Thermotropic and Monotropic types of liquid crystals.	10 M
	(b)	Explain Somectic, Nematic and Cholesteric phases of liquid crystals.	10 M
OR			
10	(a)	Explain display applications of liquid crystals. Discuss the applications of Liquid crystals in Thermal Mapping and Non-destructive testing.	10 M
	(b)	Discuss the medicinal uses and technical applications of liquid crystals.	10 M
