## **Model Question Paper**

Dual nature of radiation and Matter - relativity - Part II

12th Standard

	Physics	Reg.No. :	
I	I.Answer all the questions.		
I	II.Use Blue pen only.		
Tim	ne : 01:00:00 Hrs	Total Marks : 50	
	Part-A	5 x 1 = 5	
1)	The wavelength of matter wave is independent of		
	(a) mass (b) velocity (c) momentum (d) charge		
2)	If the kinetic energy of the moving particle is E,then the de Broglie wavelength is,		
	(a) $\lambda = \frac{h}{\sqrt{2mE}}$ (b) $\lambda = \frac{\sqrt{2mE}}{h}$ (c) $\lambda = h\sqrt{2mE}$ (d) $\lambda = \frac{h}{E\sqrt{2m}}$		
3)	The moment of electron having wavelenth 2A is		
	(a) $3.3 \times 10^{24} \text{kg}\text{m}s^{-1}$ (b) $6.6 \times 10^{24} \text{kg}\text{m}s^{-1}$ (c) $3.3 \times 10^{24} \text{kg}\text{m}s^{-1}$ (d) $6.6 \times 10^{24} \text{kg}\text{m}s^{-1}$		
4)	According to relativity, the length of a rod in motion		
	(a) is same as its rest length (b) is more than its rest length (c) is less than its rest length		
	(d) may be more or less than or equal to rest length depending on the speed of the rod		
5)	If 1kg of a substance is fully converted into energy, then the energy produced is		
	(a) $9x10^{6}$ J (b) $9x10^{24}$ J (c) 1J (d) $3x10^{8}$ J		
	Part-B	5 x 3 = 15	
6)	What are matter waves?		
7)	Mention the applications of electron microscope.		
8)	Define frame of reference.		
9)	State the postulates of special theory of relativity.		
10)	If a body moves with the velocity of light, what will be its mass? Comment on your result.		
	Part-C	6 x 5 = 30	
11)	What are the applications of photoelectric cells?		
12)	Derive an expression for the de Broglie w <mark>avelengt</mark> h of matter waves.		
13)	Discuss the cocept of space, time, and mass.		
14)	Explain time dilation.		
15)	a) State the laws of photoelectric emission		
	(OR)		
	b) Explain FitzGerald – Lorentz contraction with an example.		