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TERM END EXAMINATIONS (TEE) – December 2021- January 2022

Programme	: B.Tech. [BCE]	Semester	: Fall 2021-22
Course Name	: Engineering Physics	Course Code	: PHY1001
Faculty Name	: Dr. Suchetana Sadhukhan	Slot / Class No	: A11+A12+A13/ 0036
Time	: 1 ½ hours	Max. Marks	: 50

Answer ALL the Questions

Q. No.	Question Description	Marks
PART - A (30 Marks)		
1	(a) Find how work is done by a skater pulling in her arms during a spin. Identify the force she exerts on each arm to pull it in and the distance each moves, noting that a component of the force is in the direction moved. Why is angular momentum not increased by this action?	10
	OR	
	(b) Give the physical significance of wave function Ψ . Calculate the minimum energy an electron can possess in an infinitely deep potential well of width 4 nm.	10
2	(a) Explain the role of bottom up & top down approaches in nanotechnology?	10
	OR	
	(b) What is the role of metastable states? Elaborate it with any gas laser as example.	10
3	(a) Illustrate what is direct and indirect band gap semiconductor? Which semiconductor among these two is more suitable for semiconductor laser and why?	10
	OR	
	(b) Compute the curl and divergence of vector field $\vec{F} = x^3y^2\vec{i} + x^2y^3z^4\vec{j} + x^2z^2\vec{k}$.	10
PART - B (20 Marks)		
4	The wavelength of a photon and the de-Broglie wavelength of an electron have the same value, λ . Deduce the relation between the kinetic energy of the photon and electron.	10
5	Write down Maxwell's equations with their physical significance.	10

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