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| Reg. No.: | |
| Name : | |



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

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|---------------------|----------------------------------|------------------------|----------------------------|
| 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 |
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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)

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|---|---|----|
| 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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