	Reg. No.:	
	Name :	

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MID TERM EXAMINATIONS – December 2022

Programme	:	**B.Tech.**	Semester	:	**Winter 2022-23**
Course Title/Course Code	:	**Engineering Physics/PHY1001**	Slot	:	**A21+A22+A23**
Time	:	**1 ½ hours**	Max. Marks	:	**50**

Answer all the Questions

Q.No.	Sub. Sec.	Question Description	Marks
1		The universe is operating under the influence of various forces which are fundamental in nature. Explain these forces, and discuss their interaction domains.	**10**
2	(a)	A block slides down an incline of an angle of 30° with an acceleration of g/4. Find the kinetic friction coefficient.	**5**
	(b)	A body of mass m is suspended by two strings making angles α and β with the horizontal. Find the tensions in the strings.	**5**
3		Derive an equation that describes the time-dependent behaviour of a moving particle in quantum mechanics.	**10**
4	(a)	The wave function (Ψ) has central importance in quantum mechanics although wave function (Ψ) has no direct physical significance. Comment on this statement.	**4**
	(b)	The wave function of a certain particle is $\Psi = A\cos^2 x$ for $-\frac{\pi}{2} < x < +\frac{\pi}{2}$ (i) Find the value of A. (ii) Find the probability that the particle be found between x = 0 and $x = \frac{\pi}{4}$	**6**
5		What are the surface plasmons, and how do the surface plasmons responsible for the change in the properties of the material at the nanoscale? Explain it with an example.	**10**

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