Reg. No.:

Name :

VIT BHOPAL
www.vitbhopal.ac.in

MID TERM EXAMINATIONS – December 2022

Programme	:	**B.Tech.**	Semester	:	**Winter 2022-23**
Course Title/ Course Code	:	**Engineering Physics/ PHY1001**	Slot	:	**A11+A12+A13**
Time	:	**1 ½ hours**	Max. Marks	:	**50**

Answer all the Questions

Q.No.	Sub. Sec.	Question Description	Marks
1	a)	A man rowing a boat upstream is at rest with respect to shore (a) is he doing any work? (b) If he stops rowing and moves down with the stream is any work being done on him?	**05**
	b)	If the mass of the earth is not changed and its radius decreased by 2% then what would be effect on acceleration due to gravity on the surface of the earth?	**05**
2		A sphere of mass M and radius r slips on a rough horizontal plane. At some instant, it has translational velocity v_0 and rotational velocity about the centre $\frac{v_0}{2r}$. Find the translational velocity after the sphere starts pure rolling.	**10**
3		Boundary conditions and normalization determine the wave functions. Considering a particle trapped in a box with infinitely hard walls, comment on the above sentence and find wave function ψ_n that corresponds to various energy levels. Where is this particle most likely to be in the lowest energy level and what will be the probability of finding the particle at this location in the next higher energy state?	**10**
4		Evaluate the probability that a particle trapped in a box L wide can be found between 0.45L and 0.55L for the ground and first excited states.	**10**
5		Do the physical properties of matter depend on shape and size? What happens when we go to nanostructure in this regard? How is it possible to obtain nanoparticles of the same material yet having different colours? Explain.	**10**

⇔⇔⇔

Note:
RBT – Revised Bloom's Taxonomy
KL1 – Remember, KL2-Understand, KL3-Apply, KL4-Analyse, KL5-Evaluate, KL6-Create
CO – Course Outcome