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Dt.:23-03-2016
Wednesday

Internal test : 2016

B.Sc. Sem. IV

PHYSICS -205

Roll No._____

Time: 2.45 to 4.30
Total marks : 50

1. (a) Obtain general equation of ellipse for the emerging light from a Nikol Prism. Discuss the different cases of path difference. [08]

OR

(a) What is reverberation time ? Obtain the expression for reverberation time. [08]

(b) Write a note on Polaroid. [05]

OR

(b) Write the properties of refracted rays in double refraction. [05]

2. (a) Explain in short types of Ensemble. [06]

OR

(a) In case of one dimensional harmonic oscillator prove that " 1/h number of energy states are in unit area of phase space" [06]

(b) Explain phase space and prove that " $1/h^3$ no. of energy states are in unit area of μ - phase space" [07]

OR

(b) In case of canonical ensemble derive the equation $n_i = Ne^{-\beta\varepsilon_i}$ [07]

3. (a) Explain Michelson-Morley experiment and discuss its negative results. [10]

OR

(a) State and Obtain Ehrenfest's theorem. [10]

(b) Define the terms 'Frame of reference' and Inertial frame of reference. [02]

OR

(b) Write the postulates of special theory of relativity. [02]

4. (a) Obtain the components of angular momentum Lx, Ly, Lz . Hence prove that [Lx, Ly] = ihLz [08]

OR

(a) State the 4th postulate of the quantum mechanics. Hence prove that for dynamical variable $A(\vec{X}, \vec{P}, t)$, [08]

$$\left(\frac{dA}{dt}\right)_{OP} = \frac{1}{i\hbar}[A_{OP}, H_{OP}] + \frac{\partial A_{OP}}{\partial t}$$

(b) Prove that $[x, P] = i\hbar$ [04]

OR

(b) Prove that $[x, P^n] = ni\hbar P^{n-1}$ [04]

QUIZ

Total marks : 10

1. Write statement of ergodic hypothesis.
2. Write lioville equation.
3. Define partition functions.
4. What was hypothetical medium in Michelson-Morley experiment ?
5. Define the terms 'Blue shift'
6. Define sound absorption coefficient.
7. Define Plane polarized light.
8. Define analyser.
9. Define adjoint of an operator.
10. Write the statement of first postulate of quantum mechanics.