

Prof. Rajani

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT  
TEST -1 EXAMINATION- Sept.2017  
B.Tech I Semester (BI and BT)

COURSE CODE:16B11PH112

MAX. MARKS: 15

COURSE NAME:Basic Engineering and Applied Physics

COURSE CREDITS: 04

MAX. TIME: 1Hrs

*Note: All questions are compulsory. Carrying of mobile phone during examinations will be treated as case of unfair means.*

**Q.1. Attempt all three:**

**[3x1=3]**

- (i) Draw and label Jabolonski diagram
- (ii) Give reasons behind the origin of quantum physics
- (iii) Boundary conditions for particle in a box problem.

**Q.2. What are the quantum mechanical constraints for possible and observed electronic transitions?**

**[2.5]**

**Q.3. Derive time dependent Schrodinger's wave equation.**

**[3]**

**Q.4. Derive the amplitude and intensity distribution and interference terms respectively for two light waves.**

**[3]**

**Q.5. A photon carries  $3 \times 10^{-14}$  J of energy. It undergoes Compton scattering in a block of carbon. What is the largest fractional change in energy the photon can undergo as a result?**

**[2]**

**Q.6. An electron in hydrogen atom makes a transition from an energy state of principal quantum number  $n_1$  to  $n=2$  state. If the photon emitted has a wavelength of 450 nm.**

**[1.5]**

PH-2, BT