

JAYPEE UNIVERSITY OF INFORMATION TECHNOLOGY, WAKNAGHAT

TEST -1 EXAMINATION- 2024

B.Tech-I Semester (All Branches)

COURSE CODE(CREDITS): 18B1WPH831 (3)

MAX. MARKS: 15

COURSE NAME: OPTOELECTRONIC DEVICES

COURSE INSTRUCTORS: SKK

MAX. TIME: 1 Hour

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*Note: (a) All questions are compulsory.*

*(b) Marks are indicated against each question in square brackets.*

*(c) The candidate is allowed to make Suitable numeric assumptions wherever required for solving problems*

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1. What is Semiconductor Hetrojunction. With the help of energy level diagram, explain its working. [4]
2. What is recombination and how is recombination used for working of LED. [4]
3. List the compound semiconductors used in LED diode to work in visible spectrum. [2]
4. The work function of a material is  $3.31 \times 10^{-19}$  J. Then the maximum Kinetic energy of the photoelectrons emitted by incident wavelength of radiation 500 nm is ( Planks Constant is  $6.62 \times 10^{-34}$  J, Charge of electron is  $1.6 \times 10^{-19}$  C and Velocity of light is  $3 \times 10^8$  m/s) [3]
5. Determine the wavelength of light emitted from LED which is made up of GaAsP semiconductor , whose forbidden energy gap is 1.875 eV. Mention the colour of the light emitted (Planks Constant is  $6.62 \times 10^{-34}$  J). [2]