Physics - ICS Part 2 Physics Chapter 20 Short Questions Preparation

Q1. What is meant by line spectrum? How line spectrum can be used for the identification of elements?

Ans 1: When an electron jumps from higher energy state to lower energy state than emits energy and make a spectral line.
$E_2 - E_{1=hf}$
This is called line spectrum.And different elements emit line spectrum of different wavelengths,So they can be identifiedeasily.

Q2. Explain why laser action could not occur without population inversion between atomic levels?

Ans 1: When a large percentage of atom or sample are in population inversion,then large number of coherent photons along same direction of motion could be obtained to form laser light,It is impossible withput population inversion.

Q3. Can electron reside inside the nucleus?

Ans 1: No,electron cannot reside inside the nucleus .If electron resides inside nucleus then uncertainty in position.

Q4. Differentiate between Line and Band spectrum.

Ans 1: Line spectrum: When electron jumps from higher orbit to lower orbit ,it emits energy,This emission of energy constitutes spectral line,This is called the line spectrum.

Ans 2: Band spectrum:is produced by molecules,They are the groups of lines which are closely spaced to another.

Q5. Write down use of laser in industry.

Ans 1: It can be used for telecommunication in fibre optics.
It is used to read bar codes,
It is used to generate 3D image of objects by holography.

Q6. How can spectrum of hydrogen contain so many lines,whereas hydrogen atom contain one electron?

Ans 1: The single electron in hydrogen atom occupies ground state but it can be excited to several states by absorbing energy.During de-excitation ,it can emit several lines of different wavelength.

Q7. Write use of x-rays.

Ans 1: X-rays are used

1. To visualize the interior of the material opaque to ordinary light.
2. In computerized axial tomography.

3. In photographic films.

Q8. Define population inversion and metastable stable.

Ans 1: A condition of matter in which more electrons are in a high energy state than in a lower energy state is called population inversion.
A particular excited state of an atom that has longer lifetime than the ordinary excited states is called metastable state.

Q9. What is fluorescence?

Ans 1: Fluorescence is a property of absorbing radiant energy of high frequency and re emitting energy of low frequency in the visible region of electromagnetic spectrum.

Q10. What do we mean when we say that the atom is excited?

Ans 1: When energy from some external source is provide to an atom in its normal state,then its electron will jump from lower energy state to higher energy state.And atom is said to be excited.
