

## STRUCTURE OF ATOM (question bank 3)

1. Which of the following conclusions could not be derived from Rutherford's  $\alpha$ -particle scattering experiment?
  - a) Most of the space in the atom is empty
  - c) The radius of the atom is about  $10^{-10}$  m while that of nucleus is  $10^{-15}$  m
  - c) Electrons move in a circular path of fixed energy called orbits
  - d) Electrons and the nucleus are held together by electrostatic force of attraction.
2. On bombarding a beam of  $\alpha$ -particles on the atom of gold sheet, a few particles get deflected whereas most of them go straight and remains undeflected. This is due to
  - a) The nucleus occupy much smaller volume as compared to the volume of atom
  - b) The force of repulsion on fast moving  $\alpha$ -particles is very small.
  - c) The neutrons in the nucleus do not have any effect on  $\alpha$ -particles
  - d) The force of attraction on  $\alpha$ -particles by the oppositely charged electron is not sufficient
3. A ray of white light is spread out into series of coloured bands of visible light are called
  - a) visible band
  - b) spectrum
  - c) electronic spectrum
  - d) none of these
4. In the line spectrum of hydrogen, the lines described by the formula  
 wave number =  $109677 \left( \frac{1}{2^2} - \frac{1}{n^2} \right) \text{ cm}^{-1}$   
 where ,n= integer  $n \geq 3$  constitutes
  - a) Balmer series
  - b) Lyman series
  - b) Pfund series
  - d) Paschen series
5. According to the electromagnetic theory of Maxwell, which one is correct?
  - a) charged particle when accelerated should emit electromagnetic radiation
  - b) charged particles when accelerated should absorb electromagnetic radiation
  - c) charged particles when retarded should emit EMR
  - d) none of the above
6. Arrange the following type of radiations in increasing order of frequency.
  - a) radiations from microwave oven
  - b) amber light from traffic signal
  - c) radiations from FM radio
  - d) cosmic rays from outer space
  - e) X-rays.
7. Why are Bohr's orbits are called stationary states?
8. The series of lines appearing in UV region of electromagnetic spectrum of hydrogen is called
  - a) Bracket series
  - b) Pfund series
  - c) Lyman series
  - d) Paschen series
9. The spectrum of radiation emitted by a substance after absorbing energy is called
  - a) absorption spectrum
  - b) emission spectrum
  - c) white light spectrum
  - d) none of the above
10. Which of the following has lowest frequency?  
X-rays,  $\gamma$ - rays, microwaves
11. If travelling at same speeds, which of the following matter waves have the shortest wavelength?
  - a) electron
  - b) alpha particles ( $\text{He}^{2+}$ )
  - c) neutron
  - d) proton
12. Which of the following is responsible to rule out the existence of definite paths or trajectories of electrons?
  - a) Pauli's exclusion principle
  - b) Heisenberg's uncertainty principle
  - c) Hund's rule of maximum multiplicity
  - d) Aufbau principle.
13. Which of the following statement is not correct regarding Bohr's model of hydrogen atom?
  - a) Energy of the electron in the orbit is quantized
  - b) The electron in the orbit nearest to the nucleus has lowest energy
  - c) Electrons revolve in different orbits around the nucleus
  - d) The position and velocity of the electrons in the orbit cannot be determined simultaneously