## Atomic models and Planck's quantum theory

**43.** The specific charge of proton is $9.6 \times 10^6 Ckg^{-1}$ then for an $\alpha$-particle it will be
(a) $38.4 \times 10^7 Ckg^{-1}$
(b) $19.2 \times 10^7 Ckg^{-1}$
(c) $2.4 \times 10^7 Ckg^{-1}$
(d) $4.8 \times 10^7 Ckg^{-1}$

**44.** In hydrogen spectrum the different lines of Lyman series are present is
(a) *UV* field (b) *IR* field
(c) Visible field (d) Far *IR* field

**45.** Which one of the following is considered as the main postulate of Bohr's model of atom
(a) Protons are present in the nucleus
(b) Electrons are revolving around the nucleus
(c) Centrifugal force produced due to the revolving electrons balances the force of attraction between the electron and the protons
(d) Angular momentum of electron is an integral multiple of $\frac{h}{2\pi}$

**46.** The electronic energy levels of the hydrogen atom in the Bohr's theory are called
(a) Rydberg levels (b) Orbits
(c) Ground states (d) Orbitals

**47.** The energy of a photon is calculated by
(a) $E = h\nu$ (b) $h = E\nu$
(c) $h = \frac{E}{\nu}$ (d) $E = \frac{h}{\nu}$

**48.** Visible range of hydrogen spectrum will contain the following series
(a) Pfund (b) Lyman
(c) Balmer (d) Brackett

**49.** Radius of the first Bohr's orbit of hydrogen atom is
(a) $1.06\text{Å}$ (b) $0.22\text{Å}$
(c) $0.28\text{Å}$ (d) $0.53\text{Å}$

**50.** In Balmer series of hydrogen atom spectrum which electronic transition causes third line
(a) Fifth Bohr orbit to second one
(b) Fifth Bohr orbit to first one
(c) Fourth Bohr orbit to second one
(d) Fourth Bohr orbit to first one

**51.** Energy of electron of hydrogen atom in second Bohr orbit is
(a) $-5.44 \times 10^{-19} J$
(b) $-5.44 \times 10^{-19} kJ$
(c) $-5.44 \times 10^{-19} cal$
(d) $-5.44 \times 10^{-19} eV$

**52.** If change in energy $(\Delta E) = 3 \times 10^{-8} J, h = 6.64 \times 10^{-34} J - s$ and $c =$

$3 \times 10^8 m \rightleftarrows / \rightleftarrows s$, then wavelength of the light is

(a) $6.36 \times 10^3$ Å (b) $6.36 \times 10^5 Å$

(c) $6.64 \times 10^{-8}$ Å (d) $6.36 \times 10^{18} Å$

**53.** The radius of first Bohr's orbit for hydrogen is 0.53 Å. The radius of third Bohr's orbit would be

(a) 0.79 Å (b) 1.59 Å

(c) 3.18 Å (d) 4.77 Å

**54.** Rutherford's $\alpha$-particle scattering experiment proved that atom has

(a) Electrons (b) Neutron

(c) Nucleus (d) Orbitals

**55.** Wavelength of spectral line emitted is inversely proportional to

(a) Radius

(b) Energy

(c) Velocity

(d) Quantum number

**56.** The energy of a radiation of wavelength 8000 Å is $E_1$ and energy of a radiation of wavelength 16000 Å is $E_2$. What is the relation between these two

(a) $E_1 = 6E_2$ (b) $E_1 = 2E_2$

(c) $E_1 = 4E_2$ (d) $E_1 = 1/2E_2$

(e) $E_1 = E_2$

**57.** The formation of energy bonds in solids are in accordance with

(a) Heisenberg's uncertainty principle

(b) Bohr's theory

(c) Ohm's law

(d) Rutherford's atomic model

**58.** The frequency of yellow light having wavelength 600 *nm* is

(a) $5.0 \times 10^{14} Hz$ (b) $2.5 \times 10^7 Hz$

(c) $5.0 \times 10^7 Hz$ (d) $2.5 \times 10^{14} Hz$

**59.** The value of the energy for the first excited state of hydrogen atom will be

(a) $-13.6eV$ (b) $-3.40eV$

(c) $-1.51eV$ (d) $-0.85eV$

**60.** Bohr model of atom is contradicted by

(a) Pauli's exclusion principle

(b) Planck quantum theory

(c) Heisenberg uncertainty principle

(d) All of these

**61.** Which of the following is not true in Rutherford's nuclear model of atom

(a) Protons and neutrons are present inside nucleus

(b) Volume of nucleus is very small as compared to volume of atom

(c) The number of protons and neutrons are always equal

(d) The number of electrons and protons are always equal

**62.** The emission spectrum of hydrogen is found to satisfy the expression for the

energy change. $\Delta E$ (in joules) such that $\Delta E = 2.18 \times 10 \left(\frac{1}{n_1^2} - \frac{1}{n_2^2}\right) J$ where $n_1$ = 1, 2, 3….. and $n_2$ = 2, 3, 4……. The spectral lines correspond to Paschen series to

(a) $n_1 = 1$ and $n_2 = 2,3,4$
(b) $n_1 = 3$ and $n_2 = 4,5,6$
(c) $n_1 = 1$ and $n_2 = 3,4,5$
(d) $n_1 = 2$ and $n_2 = 3,3,5$
(e) $n_1 = 1$ and $n_2 =$ infinity