| Date Planned : __ / __ / __ | Daily Tutorial Sheet - 3 | Expected Duration : 90 Min |
|---|---|---|
| Actual Date of Attempt : __ / __ / __ | Level - 1 | Exact Duration :_____ |

**31.** Which one of the following sets of ions represents a collection of isoelectronic species?

**(A)** $K^+$, $Cl^-$, $Ca^{2+}$, $Sc^{3+}$ **(B)** $Ba^{2+}$, $Sr^{2+}$, $K^+$, $S^{2-}$

**(C)** $N^{3-}$,$O^{2-}$, $F^-$, $S^{2-}$ **(D)** $Li^+$, $Na^+$, $Mg^{2+}$, $Ca^{2+}$

**32.** Which of the following statements does not form a part of Bohr's model of hydrogen atom?

**(A)** Energy of the electrons in the orbit is quantized

**(B)** The electron in the orbit nearest to the nucleus has the 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

**33.** $\alpha$ – particles are represented by :

**(A)** lithium atoms **(B)** helium nuclei

**(C)** hydrogen nuclei **(D)** None of these

**34.** The transition of electrons in H atom that will emit maximum energy is:

**(A)** $n_3 \rightarrow n_2$ **(B)** $n_4 \rightarrow n_3$ **(C)** $n_5 \rightarrow n_4$ **(D)** $n_6 \rightarrow n_5$

**35.** If the energy of electron in H atom is given by expression, $-1312 / n^2$ kJ $mol^{-1}$, then the energy required to excite the electron from ground state to second orbit is:

**(A)** 328 kJ/mol **(B)** 656 kJ/mol **(C)** 984 kJ/mol **(D)** 1312 kJ/mol

**36.** The work function of a metal is 4.2 eV. If radiations of 2000 Å fall on the metal, then the kinetic energy of the fastest photoelectron is:

**(A)** $1.6 \times 10^{-19}$ J **(B)** $16 \times 10^{10}$ J **(C)** $3.2 \times 10^{-19}$ J **(D)** $6.4 \times 10^{-10}$ J

**37.** The ratio of the radii of the three Bohr orbits for a given atom is:

**(A)** 1 : 1/ 2 : 1/3 **(B)** 1 : 2 : 3 **(C)** 1 : 4 : 9 **(D)** 1 : 8 : 27

**38.** If the threshold wavelength $(\lambda_0)$ for ejection of electron from metal is 330 nm, then work function for the photoelectric emission is:

**(A)** $1.2 \times 10^{-18}$ J **(B)** $1.2 \times 10^{-20}$ J **(C)** $6 \times 10^{-19}$ J **(D)** $6 \times 10^{-12}$ J

**39.** In excited H atom, when electron drop from n = 4, 5, 6 to n = 1, there is emission of:

**(A)** UV light **(B)** Visible light **(C)** IR light **(D)** Radio waves

**40.** In Bohr's stationary orbits:

**(A)** electrons do not move

**(B)** electrons emit radiations while moving

**(C)** energy of the electron remains constant

**(D)** angular momentum of the electrons is $h / 2\pi$

**41.** At 200°C, hydrogen molecule have velocity 2.4 × $10^5$ cm $s^{-1}$. The de Broglie wavelength in this case is approximately.

**(A)** 1 Å **(B)** 1000 Å **(C)** $0.529 \times \frac{4}{3}$ Å **(D)** 10 Å

**42.** The radius of second Bohr's orbit of Hydrogen atom is:

**(A)** 0.053 nm **(B)** $\frac{0.053}{4}$ nm **(C)** 0.053 × 4 nm **(D)** 0.053 × 20 nm

**43.** The radius of the second Bohr orbit for $Li^{2+}$ is :

**(A)** $0.529 \times \frac{4}{3}$ Å **(B)** $0.529 \times \frac{2}{3}$ Å **(C)** $0.529 \times \frac{4}{9}$ Å **(D)** $0.529 \times \frac{2}{3}$ Å

**44.** If velocity of an electron in 1st orbit of H atom is v, what will be the velocity in 3rd orbit of $Li^{2+}$ ?

**(A)** v **(B)** v/3 **(C)** 3v **(D)** 9v

**45.** How many number of atomic orbitals associated with M-shell?

**(A)** 9 **(B)** 12 **(C)** 16 **(D)** 25