Date Planned : __ / __ / __	Daily Tutorial Sheet - 1	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	JEE Main (Archive)	Exact Duration :_____

***1.** The atomic nucleus contains: **(1988)**

(A) protons **(B)** neutrons **(C)** electrons **(D)** photons

2. Uncertainty in position of a minute particle of mass 25 g in space is 10^{-5}m. What is the uncertainty in its velocity (in m s^{-1})? **(2002)**

(A) 2.1×10^{-34} **(B)** 0.5×10^{-34} **(C)** 2.1×10^{-28} **(D)** 0.5×10^{-23}

3. In a hydrogen atom, if energy of an electron in ground state is 13.6 eV, then that in the 2nd excited state is **(2002)**

(A) 1.51 eV **(B)** 3.4 eV **(C)** 6.04 eV **(D)** 13.6 eV

4. The de Broglie wavelength of a tennis ball of mass 60 g moving with a velocity of 10 metres per second is approximately (Planck's constant, $h = 6.63\times10^{-34}$ J s) **(2003)**

(A) 10^{-33} metres **(B)** 10^{-31} metres **(C)** 10^{-16} metres **(D)** 10^{-25} metres

5. In Bohr series of lines of hydrogen spectrum, the third line from the red end corresponds to which one of the following inter-orbit jumps of the electron for Bohr orbits in an atom of hydrogen ? **(2003)**

(A) $3\rightarrow2$ **(B)** $5\rightarrow2$ **(C)** $4\rightarrow1$ **(D)** $2\rightarrow5$

6. Consider the ground state of Cr atom $(Z = 24)$. The numbers of electrons with the azimuthal quantum numbers, $l = 1$ and 1 are, respectively **(2004)**

(A) 12 and 4 **(B)** 12 and 5 **(C)** 16 and 4 **(D)** 16 and 5

7. Uncertainty in the position of an electron (mass $= 9.1\times10^{-31}$kg) moving with a velocity $300\,\text{m s}^{-1}$, accurate upto 0.001% will be **(2006)**

$(h = 6.6\times10^{-34}\,\text{J s})$

(A) 19.2×10^{-2} m **(B)** 5.76×10^{-2} m **(C)** 1.92×10^{-2} m **(D)** 3.84×10^{-2} m

8. Which of the following sets of quantum numbers represents the highest energy of an atom ? **(2007)**

(A) $n = 3, l = 0, m = 0, s = +\frac{1}{2}$ **(B)** $n = 3, l = 1, m = 1, s = +\frac{1}{2}$

(C) $n = 3, l = 2, m = 1, s = +\frac{1}{2}$ **(D)** $n = 4, l = 0, m = 0, s = +\frac{1}{2}$

9. In an atom, an electron is moving with a speed of 600 m/s with an accuracy of 0.005%. Certainty with which the position of the electron can be located is ($h = 6.6\times10^{-34}$ kg $\text{m}^2\,\text{s}^{-1}$, mass of electron, $e_m = 9.1\times10^{-31}$ kg) **(2009)**

(A) 1.52×10^{-4} m **(B)** 5.10×10^{-3} m

(C) 1.92×10^{-3} m **(D)** 3.84×10^{-3} m

10. Calculate the wavelength (in nanometer) associated with a proton at $1.0\times10^{3}\,\text{m s}^{-1}$. **(2009)**

(Mass of proton $= 1.67\times10^{-27}$ kg and $h = 6.63\times10^{-34}$ J s)

(A) 0.032 nm **(B)** 0.40 nm **(C)** 2.5 nm **(D)** 14.0 nm

11. Ionisation energy of He^+ is 19.6×10^{-18}J atom^{-1}. The energy of the first stationary state $(n=1)$ of Li^{2+} is : **(2010)**

(A) 8.82×10^{-17} J atom^{-1} **(B)** 4.41×10^{-16} J atom^{-1}

(C) -4.41×10^{-17} J atom^{-1} **(D)** -2.2×10^{-15} J atom^{-1}

12. A gas absorbs a photon of 355 nm and emits at two wavelengths. If one of the emission is at 680 nm, the other is at **(2011)**

(A) 1035 nm **(B)** 325 nm **(C)** 743 nm **(D)** 518 nm

13. The electrons, identified by quantum numbers n & ℓ, (i) $n=4, \ell=1$, (ii) $n=4, \ell=0$, (iii) $n=3, \ell=2$, (iv) $n=3, \ell=1$ can be placed in order of increasing energy, from the lowest to highest, as : **(2012)**

(A) (iv) < (ii) < (iii) < (i) **(B)** (ii) < (iv) < (i) < (iii)

(C) (i) < (iii) < (ii) < (iv) **(D)** (iii) < (i) < (iv) < (ii)

14. The correct set of four quantum numbers of the valence electrons of Rubidium atom $(Z=37)$ is:

(A) $5, 0, 0, +\frac{1}{2}$ **(B)** $5, 1, 0, +\frac{1}{2}$ **(C)** $5, 1, 1, +\frac{1}{2}$ **(D)** $5, 0, 1, +\frac{1}{2}$ **(2014)**

15. Energy of an electron is given by $E=-2.178\times10^{-18}J\left(\frac{Z^2}{n^2}\right)$. Wavelength of light required to excite an electron in an hydrogen atom from level $n=1$ to $n=2$ will be: **(2014)**

$\left(h=6.62\times10^{-34}Js \text{ and } c=3.0\times10^{8}ms^{-1}\right)$

(A) 1.214×10^{-7} m **(B)** 2.816×10^{-7} m

(C) 6.500×10^{-7} m **(D)** 8.500×10^{-7} m