Topic :-Atoms

1. In Raman effect, Stokes' lines are spectral lines having
   a) Frequency greater than that of the original line
   b) Wavelength equal to that of the original line
   c) Wavelength less than that of the original line
   d) Wavelength greater than that of the original line

2. Which of the following atoms has the lowest ionization potential?
   a) $^{14}_{7}N$ b) $^{133}_{55}Cs$ c) $^{40}_{18}Ar$ d) $^{16}_{8}O$

3. For hydrogen atom electron in n th Bohr orbit, the ratio of radius of orbit to its de-Broglie wavelength is
   a) $\frac{n}{2\pi}$ b) $\frac{n^2}{2\pi}$ c) $\frac{1}{2\pi n}$ d) $\frac{1}{2\pi n^2}$

4. If the electron in hydrogen atom jumps from the third to second orbit, the wavelength of the emitted radiation in terms of Rydberg constant R is given by
   a) $\lambda = \frac{36}{5R}$ b) $\lambda = \frac{5R}{36}$ c) $\lambda = \frac{5}{R}$ d) $\lambda = \frac{R}{6}$

5. In Bohr's model of hydrogen atom, which of the following pairs of quantities are quantized?
   a) Energy and linear momentum   b) Linear and angular momentum
   c) Energy and angular momentum   d) None of the above

6. In the Bohr's model of the hydrogen atom, the lowest orbit corresponds to
   a) Infinite energy   b) Maximum energy
   c) Minimum energy   d) Zero energy

7. The atomic number and the mass number of an atom remains unchanged when it emits
   a) a photon   b) a neutron   c) β - particle   d) An α - particle

8. Band spectrum is also called
   a) Molecular spectrum   b) Atomic spectrum
   c) Flash spectrum   d) Line absorption spectrum

9. In a hydrogen atom, the electron moves around the nucleus in a circular orbit of radius 5×10^{-11}m. Its time period is 1.5×10^{-16}. The current associated with the electron motion is (charge of electron is 1.6×10^{-16} C)

   a) 1.00 A
   b) 1.066×10^{-3} A
   c) 1.81×10^{-3} A
   d) 1.66×10^{-3}

10. Bohr's atom model assumes
   a) The nucleus is of infinite mass and is at rest
   b) Electrons in a quantized orbit will not radiate energy
   c) Mass of electron remains constant
   d) All the above conditions.

11. An electron of charge e moves with a constant speed v along a circle of radius r, its magnetic moment will be
   a) evr
   b) $evr/2$
   c) $\pi r^2 ev$
   d) $2\pi rev$

12. The ratio of the wavelengths for $2 \rightarrow 1$ transition in Li^{2+}, He^+ and H is
   a) 1:2:3
   b) $\frac{1}{9} : \frac{1}{4} : \frac{1}{1}$
   c) 1:4:1
   d) 3:2:1

13. Ionization potential of hydrogen atom is 13.6 eV. Hydrogen atoms in the ground state are exicted by monochromatic radiation of photon energy 12.1 eV. The spectral lines emitted by hydrogen atom according to Bohr's theory will be
   a) One
   b) Two
   c) Three
   d) Four

14. The production of band spectra is caused by
   a) Atomic nuclei
   b) Hot metals
   c) Molecules
   d) Electrons

15. In Rutherford scattering experiment, what will be the correct angle for α scattering for an impact parameter b=0?
   a) 90°
   b) 270°
   c) 0°
   d) 180°

16. According to Bohr's atomic model, the relation between principal quantum number(n) and radius of orbit(r) is
   a) $r \propto n^2$
   b) $r \propto \frac{1}{n^2}$
   c) $r \propto \frac{1}{n}$
   d) $r \propto n$

17. In the spectrum of hydrogen atom, the ratio of the longest wavelength in Lyman series to the longest wavelength in the Balmer series is
   a) 5/27
   b) 1/93
   c) 4/9
   d) 3/2

18. The wave number of the energy emitted when electron comes from fourth orbit to second orbit in hydrogen is 20,397 cm^{-1}. The wave number of the energy for the same transition in He$^+$ is
    a) 5,099 cm^{-1} b) 20,497 cm^{-1} c) 14400 Å   d) 81,588 cm^{-1}

19. At the time of total solar eclipse, the spectrum of solar radiation will have
    a) A large number of dark Fraunhofer lines
    b) A smaller number of dark Fraunhofer lines
    c) No lines at all
    d) All Fraunhofer lines changed into bright coloured lines

20. What is the difference of angular momenta of an electron in two consecutive orbits in hydrogen atom?
    a) $\dfrac{h}{2}$ b) $\dfrac{h}{\pi}$ c) $\dfrac{2\pi}{h}$ d) $\dfrac{h}{2\pi}$