Date Planned : __ / __ / __	Daily Tutorial Sheet - 2	Expected Duration : 90 Min
Actual Date of Attempt : __ / __ / __	Level - 1	Exact Duration :_____

16. Consider the following statements for an electron moving in nth orbit of hydrogen like species of atomic number Z?

I. Kinetic energy $\propto \frac{Z^2}{n^2}$ **II.** Frequency of revolution $\propto \frac{Z^2}{n^3}$

III. Coulombic force of attraction $\propto \frac{Z^3}{n^4}$ **IV.** Momentum $\propto \frac{Z}{n}$

The correct choice is:

(A) I, II, IV **(B)** I, III **(C)** II, III **(D)** I, II, III, IV

17. The correct statement about proton is:

(A) It is nucleus of deuterium **(B)** It is an ionised hydrogen atom

(C) It is an ionized hydrogen molecule **(D)** It is an α – particle

18. When a gold sheet is bombarded by a beam of α – particles, only a few of them get deflected, whereas most go straight, undeflected. This is because:

(A) The force of attraction exerted on α – particles by electrons is insufficient

(B) The volume of nucleus is much smaller than atom

(C) The force of repulsion acting on fast moving α – particles due to nucleus is very small

(D) The neutrons have no effect on α – particles

19. The charge to mass ratio of α – particles is approximately..... the charge to mass ratio of protons:

(A) six times **(B)** four times **(C)** half **(D)** two times

20. Which of the following atom does not contain the same number of protons and neutrons in its nucleus?

(A) Carbon **(B)** Deuterium **(C)** Tritium **(D)** Nitrogen

21. The radius of which of the following orbit is same as that of the first Bohr's orbit of hydrogen atom?

(A) Li^{2+} (n = 2) **(B)** Li^{2+} (n = 3) **(C)** Be^{3+} (n = 2) **(D)** He^{+} (n = 2)

22. According to Bohr's theory, the angular momentum for an electron of 3rd orbit is:

(A) $3\frac{h}{2\pi}$ **(B)** $1.5\frac{h}{2\pi}$ **(C)** $9\frac{h}{2\pi}$ **(D)** $2\frac{h}{\pi}$

23. The ratio of kinetic energy and total energy of an electron in a Bohr orbit of a hydrogen like species is:

(A) 1 **(B)** –1 **(C)** 2 **(D)** $-\frac{1}{2}$

24. The number of photons emitted per second by a 60 W source of monochromatic light of wavelength 663 nm is: $(h = 6.63 \times 10^{-34}\ Js)$

(A) 4×10^{-20} **(B)** 1.5×10^{20} **(C)** 2×10^{-20} **(D)** 2×10^{20}

25. The ionisation enthalpy of hydrogen atom is $1.312 \times 10^6\ J\ mol^{-1}$. The energy required to excite the electron in the atom from n = 1 to n = 2 is:

(A) $8.51 \times 10^5\ J\ mol^{-1}$ **(B)** $6.56 \times 10^5\ J\ mol^{-1}$

(C) $7.56 \times 10^5\ J\ mol^{-1}$ **(D)** $9.84 \times 10^5\ J\ mol^{-1}$

26. Time period of a wave is 5×10^{-3} s , what is the frequency?

(A) $5 \times 10^{-3}\ s^{-1}$ **(B)** $2 \times 10^{2}\ s^{-1}$ **(C)** $23 \times 10^{3}\ s^{-1}$ **(D)** $5 \times 10^{2}\ s^{-1}$

27. An electron from one Bohr stationary orbit can go to next higher orbit:

(A) by emission of electromagnetic radiation

(B) by absorption of any electromagnetic radiation

(C) by absorption of electromagnetic radiation of particular frequency

(D) without emission or absorption of electromagnetic radiation

28. An isobar of $^{40}_{20}Ca$ is:

(A) $^{40}_{18}Ar$ **(B)** $^{38}_{20}Ca$ **(C)** $^{1}_{1}H^{+}$ **(D)** $^{38}_{18}Ar$

29. The energy of second Bohr orbit of the hydrogen atom is $-328\ kJ\ mol^{-1}$; hence the energy of fourth Bohr orbit would be:

(A) $-41\ kJ\ mol^{-1}$ **(B)** $-1312\ kJ\ mol^{-1}$

(C) $-164\ kJ\ mol^{-1}$ **(D)** $-82\ kJ\ mol^{-1}$

30. The radius of the first Bohr orbit of hydrogen atom is 0.529 Å . The radius of the third orbit of H will be:

(A) 8.46 Å **(B)** 0.705 Å **(C)** 1.59 Å **(D)** 4.76 Å