DPP
DAILY PRACTICE PROBLEMS

CLASS : XIth | **Solutions** | **SUBJECT : CHEMISTRY**
DATE : | **DPP No. : 9**

Topic :- STRUCTURE OF ATOM

1 **(c)**

$3d$-subshell has five orbitals. Each orbital can have one electron with spin $+1/2$.

2 **(a)**

The no. of nucleons in O^{16} and O^{18} are 16 and 18 respectively.

3 **(b)**

de-Broglie wavelength, $\lambda = \frac{h}{p} = \frac{h}{mv}$

($\because$ momentum $p = mv$)

$$\Rightarrow \lambda = \frac{6.62 \times 10^{-34}\text{J} - \text{s}}{6.62 \times 10^{-27} \times 10^{6}\text{kg m/s}}$$

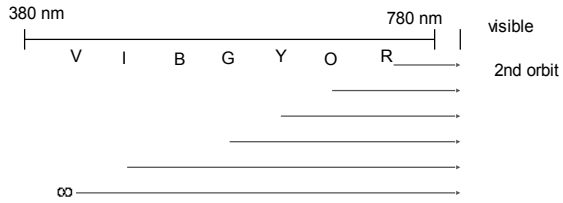
$$= 10^{-13}\text{m}$$

4 **(a)**

For $n = 2$; l can have value only 0 and 1, *i.e.*,s and p-subshells.

5 **(b)**

Hydrogen spectrum coloured radiation means visible radiation corresponds to Balmer series ($n_1 = 2, n_2 = 3,4$ ...)



3rd line from the red end it means 5→2

6 **(d)**

Frequencies emitted

$$= \sum (n-1) = \sum (5-1) = \sum 4$$

$$= 1 + 2 + 3 + 4 = 10$$

7 **(a)**

Heisenberg's uncertainty principle; de Broglie's dual concept.

8 **(c)**

Follow planck's quantum theory.

9 **(c)**

As per Pauli's exclusion principle "no two electrons in the same atom can have all the four quantum numbers equal or an orbital cannot contain more than two electrons and it can accommodate two electrons only when their directions of spins are opposite."

10 **(d)**

Br (At. no.=35)

E.C. $= 1s^2,2s^2 2p^6,3s^2 3p^6 3d^{10},4s^2 4p^5$

$\therefore$ Br atom has 17 p-electrons.

11 **(a)**

K^+ and Ar both have 18 electrons.

12 **(d)**

Since $m = 2$ and thus, l must be not lesser than m.

13 **(b)**

Cr (24) $= 1s^2,2s^2,2p^6,3s^2,3p^6,3d^5,4s^1$

14 **(d)**

Configuration of atomic number 14 is

$1s^2,2s^2 2p^6,3s^2 3p^2$;

One p-orbital and five d-orbitals are vacant.

15 **(c)**

$$E_n = -\frac{13.6}{n^2}\text{ eV}$$

For second excited state $n = 3$,

$$E_3 = -\frac{13.6}{9} = -1.51\text{eV}$$

16 **(a)**

$$\text{Kinetic energy} = \frac{Ze^2}{2r}$$

17 **(d)**

$E_1 = -13.6$ eV; Thus, it can absorb 13.6 eV to get itself knocked out.

18 **(b)**

Wave-nature of electrons was first demonstrated by de-Broglie's who gave following equation for the wavelength of electrons

$$\lambda = \frac{h}{mv}$$

19 **(b)**

$$E_n = \frac{-13.6 \times Z^2}{n^2}\text{eV}$$

For H atom, $Z = 1$,

$$-3.4 = \frac{-13.6 \times (1)^2}{n^2}$$

$\Rightarrow n^2 = 4$

$\therefore n = 2$

20 **(d)**

This is according to Pauli's exclusion principle. The principle states that no two electrons of the same atom can have all the four quantum number values identical.

ANSWER-KEY										
Q.	1	2	3	4	5	6	7	8	9	10
A.	C	A	B	A	B	D	A	C	C	D
Q.	11	12	13	14	15	16	17	18	19	20
A.	A	D	B	D	C	A	D	B	B	D