

**Daily Tutorial Sheet 2**

**JEE Advanced (Archive)**

- 16.(AC)** Many elements have several isotopes. For such elements, atomic mass is average of the atomic masses of different isotopes, which is usually non-integral.
- 17.(BD)** Isotones have same number of neutrons.  
 ${}_{32}\text{Ge}^{76}$ ,  ${}_{33}\text{As}^{77}$  and  ${}_{34}\text{Se}^{78}$  have same number (44) of neutrons, hence they are isotones.
- 18.(D)** Neutron has no charge, hence  $e/m$  is zero for neutron. Next,  $\alpha$ -particle ( $\text{He}^{2+}$ ) has very high mass compared to proton and electron, therefore very small  $e/m$  ratio. Proton and electron have same charge (magnitude) but former is heavier, hence has smaller value of  $e/m$ .  $\frac{e}{m} : n < \alpha < p < e$
- 19.(B)** Bohr's model is applicable to one-electron system only.
- 20.(B)** The wavelength order is X-ray < ultraviolet < infrared < radio wave
- 21.(B)** Radius of a nucleus is in the order of  $10^{-13}$  cm, a fact.
- 22.(D)** For Tritium : Number of neutrons + Number of protons = 3
- 23.(False)**  $3d_{x^2-y^2}$  orbital lies in XY-plane
- 24.(D)**  $E = \frac{hc}{\lambda} \Rightarrow \frac{E_1}{E_2} = \frac{\lambda_2}{\lambda_1} = 2$
- 25.(C)**

$n$	$l$	$m$	$s$
3	2	-3	$\frac{1}{2}$

  
 This is the wrong set of quantum number because  $|m|$  cannot be greater than  $l$ .
- 26.(B)** According to Rutherford's model, there is a heavily positively charged nucleus and negatively charged electrons occupy space around it in order to maintain electro-neutrality.
- 27.(C)** Fluorine, a halogen, is the most electronegative atom, has the electronic configuration  $2s^2 2p^5$  (valence shell).
- 28.(B)** Option (B) is wrong representation according to Aufbau principle. A high energy atomic orbital (2p) cannot be filled unless the low energy orbital (2s) is completely occupied. In case of option (A), Hund's rule is violated.
- 29.(A)** The atoms having same number of neutrons are called isotones.  ${}^{14}_6\text{C}$ ,  ${}^{15}_7\text{N}$ , and  ${}^{17}_9\text{F}$  have same number of neutrons. All of them have 8 neutrons ( $Z - A = 8$ )