Spin–orbit interaction is very small

(a) for light atoms

(b) for heavy atoms

(c) for moderate atoms

(d) for none of the above.

10. In the case of hydrogen molecule ion, the minimum potential energy equivalent to dissociation energy is theoretically calculated as

(a) 1.76 eV (b) 2.78 eV

(c) 3.14 eV (d) 4.72 eV.

11. In the case of hydrogen molecule, the equilibrium value for r_{AB} is theoretically calculated as

(a) 0.74 Å (b) 0.8 Å

(c) 1.06 Å (d) 1.32 Å.

12. In the case of sp^3 hybridisation, the bond angle is

(a) 180° (b) 120°

(c) 109°28' (d) 99°28'.

13. Frequency emitted or absorbed during transition process is

(a) $\frac{E_m - E_n}{h}$ (b) $\frac{E_m + E_n}{h}$

(c) $\frac{E_m - E_n}{h^2}$ (d) $(E_m - E_n)\,h$.

14. Einstein's coefficient $B_{n \to m}$ is

(a) equal to $A_{m \to n}$

(b) equal to $B_{m \to n}$

(c) equal to $A_{m \to n}$ and $B_{m \to n}$

(d) not equal to $A_{m \to n}$ or $B_{m \to n}$.

15. Einstein's coefficients $A_{m \to n}$ and $B_{m \to n}$ are related by

(a) $\frac{A_{m \to n}}{B_{m \to n}} = \frac{8\pi h\upsilon^3_{mn}}{c}$

(b) $\frac{A_{m \to n}}{B_{m \to n}} = \frac{8\pi h\upsilon^3_{mn}}{c^2}$

(c) $\frac{A_{m \to n}}{B_{m \to n}} = \frac{8\pi h\upsilon^3_{mn}}{c^3}$

(d) $\frac{A_{m \to n}}{B_{m \to n}} = \frac{8\pi h\upsilon_{mn}}{c^3}$