3. In hydrogen molecule, the energy of dissoci' 'ion of the molecule into atoms is theoretically calculated to be.

(a) 1.76 eV (b) 2.78 eV

(c) 3.14 eV (d) 4.14 eV.

4. Let A_{21} and B_{21} be Einstein's coefficients, then

(a) $\frac{A_{21}}{B_{21}} = \frac{8\pi h\upsilon^3}{C^2}$

(b) $\frac{A_{21}}{B_{21}} = \frac{8\pi h\upsilon^2}{C^3}$

(c) $\frac{A_{21}}{B_{21}} = \frac{C^3}{8\pi h\upsilon^3}$

(d) $\frac{A_{21}}{B_{21}} = \frac{8\pi h\upsilon^3}{C^3}$.

5. The lowering operator is

(a) $(\hat{p} + imw\,\hat{x})$ (b) $(\hat{p} - imw\,\hat{x})$

(c) $(imw\,\hat{x} - \hat{p})$ (d) $(\hat{p} \pm imw\,\hat{x})$.

Answer ALL questions in 1 or 2 sentences :

6. Define Green's function.

7. What is meant by self-consistent field?

8. What is meant by hybridization?

9. Define Einstein's coefficients.

10. What is a field?

SECTION B — (5 × 4 = 20 marks)

Answer ALL questions, choosing either (a) or (b).

11. (a) Explain the terms differential scattering cross-section and total scattering cross-section.

Or

(b) Explain briefly the condition for validity of Born's approximation.

12. (a) What is meant by Central field approximation?

Or

(b) Give an account of the terms arising due to L-S coupling in complex atoms.

13. (a) Explain briefly the term spin orbit interaction.

Or

(b) Write a note on covalent bonding.