

Fill up the blanks :

6. The Born approximation simply amounts neglecting the rescattering of the scattered waves provided _____.

7. Hartree assumed that the electrons in a multi electron atom move independently in a _____.

8. In covalent bonding one or more pairs of electrons are _____ by the two atoms.

9. The transition probabilities of _____ and _____ are the same.

10. A physical system having infinite degrees of freedom is called a _____.

Match the following :

11. Scattering cross-section (a) Hydrogen molecule

12. Self-consistent field (b) Dirac

13. Covalent bond (c) Hartree

14. Transition probability (d) Barn

15. Field quantization (e) Einstein.

Answer in 1 or 2 sentences :

16. Define Green's function.

17. What is meant by doublet separation in alkali spectra?

18. What is meant by spin orbit interaction?

19. Why is the theory of radiation considered semi-classical?

20. What is a number operator?

SECTION B — (5 × 6 = 30 marks)

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

21. (a) Explain the terms differential scattering cross-section, total scattering cross-section and scattering amplitude.

Or

(b) Write a note on phase shifts in partial wave analysis.