

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2018
(Second Semester)

Branch – PHYSICS

QUANTUM MECHANICS – II

Time : Three Hours

Maximum : 75 Marks

Answer ALL questions

ALL questions carry EQUAL marks

(5 x 15 = 75)

1 a Derive an expression for scattering amplitude in terms of Green's function.

OR

b What is the Born approximation? Discuss about the validity of the Born approximation.

2 a Explain in detail about (i) Thomas – Fermi Model and (ii) Hartree's self consistent field.

OR

b Write a note on (i) coupling schemes (ii) doublet separation and (iii) doublet intensity.

3 a Explain in detail about Heitler London method.

OR

b Discuss about (i) spin-orbit interaction as correction to central field approximation and (ii) hydrogen molecule ion.

4 a Describe in detail about Einstein's coefficients.

OR

b Explain in detail about (i) emission and absorption rates and density matrix.

5 a Discuss about (i) classical Lagrangian equation and (ii) classical Hamiltonian equation.

OR

b Explain about quantization of the non-relativistic Schrodinger equation.

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END