

PARUL UNIVERSIT
FACULTY OF APPLIED SCIENCE
M.Sc. Winter 2017-18 Examination

Semester: 3**Date: 19/12/17****Subject Code: 11204201****Time: 10.30am to 01.00pm****Subject Name: Nuclear Physics-1 Advance Quantum Mechanics-1 and Instrumentation****Total Marks: 60****Instructions:**

1. All questions are compulsory.
2. Figures to the right indicate full marks.
3. Make suitable assumptions wherever necessary.
4. Start new question on new page.

Q.1. A) Answer the following questions

- (a) Explain types of noises in electrical system. (04)
- (b) Explain magnetic moments in detail. (04)

Q.1. B) Answer the following question (Any two)

- (a) 1. Types of noises in electrical system. (02)
2. Explain pyrometer in short. (02)
- (b) Explain molecular beam experiment on hydrogen. (04)
- (c) Explain hyperfine structure of atomic spectra. (04)

Q.2. A) Answer the following questions.

- (a) 1. What is scattering length. (02)
2. Explain excited state of deuteron. (02)
- (b) Explain deuteron in brief (04)

Q.2. B) Answer the following questions (Any two)

1. (a) Kinematic of scattering process. (03)
(b) Explain differential and total cross section elastic and inelastic scattering. (03)
(c) Derive green's theorem. (03)

Q.3. A) Answer the following questions (Each of 04 marks) (08)

- (a) Write a brief description of effect of an external magnetic field on the hyper fine structure.

Q.3. B) Answer the following questions (Any two)

- (a) Explain in brief about Pyrometer (04)
- (b) Explain the eikonal approximation. (04)
- (c) Explain the born series. (04)

Q.4. A) Answer the following questions.

- (a) Write a note on neutron proton scattering at low energy. (04)
- (b) Write a short note on singlet state in n-p system (04)

Q.4. B) Answer the following questions (Any two)

- (a) Write a note on characteristic of transducers. (03)
- (b) Write a note on single to noise ratio (03)
- (c) Write a note on Piezoelectric. (03)