

UNIVERSITY OF PETROLEUM AND ENERGY STUDIES

End Semester Examination, December 2017

Program: : M.Tech (Nuclear Science and Technology)

Semester : I

Subject (Course): Nuclear Physics

Max. Marks : 100

Course Code: NSAT 7001

Duration : 3 Hrs

No. of page/s: 2

SECTION - A

Answer all questions (each question carries 5 marks)

1. State the basic assumptions of Shell model of nucleus.
2. Write the different properties of nuclear force.
3. Explain briefly the importance of electric quadrupole moment and nuclear magnetic moment.
4. Write short notes on :
 - i) Nuclear size
 - ii) Nuclear shapes

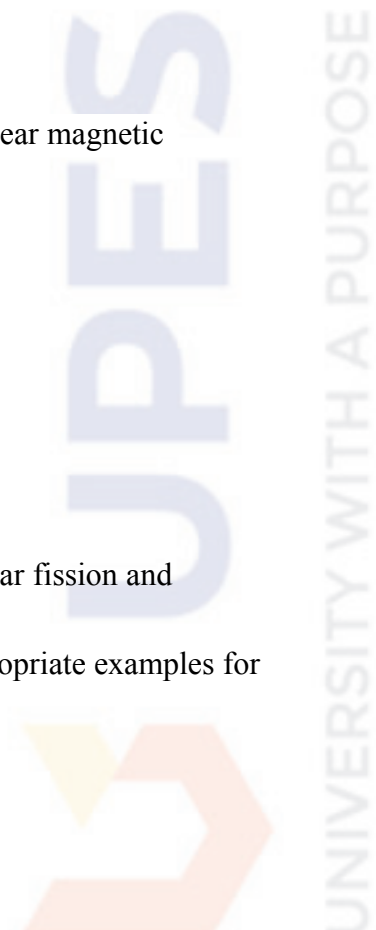
SECTION- B

Answer all questions (each question carries 10 marks)

5. Explain briefly, why an electron cannot be a nuclear constituent.
6. Discuss the Binding energy curve and on basis of this, explain nuclear fission and nuclear fusion.
7. Explain direct, indirect and compound nuclear reactions giving appropriate examples for each.
8. Describe origin of term(s) in semi empirical mass formula.

OR

Explain the nuclear fission theory based on the Liquid Drop Model



SECTION- C

Answer both the questions (each question carries 20 marks)

9. Analyze quantum mechanically the deuteron bound state system in detail.
10. Explain the Fermi theory of beta decay

OR

Describe in detail all the evidence in favor of shell model
