14PHP05

PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

MSc DEGREE EXAMINATION MAY 2018
(Second Semester)

Branch – PHYSICS

<u>NUCLEAR PHYSICS</u>

Time : Three Hours   Maximum : 75 Marks

Answer **ALL** questions
ALL questions carry **EQUAL** marks   (5 x 15 = 75)

1 a Derive Weizasckar's semi empirical mass formula.

OR

   b Give an account of single particle shell model which predicts the magic numbers.

2 a Describe the Gamow's theory of alpha decay.

OR

   b Discuss the internal conservation and derive an equation for fermi's theory of β-decay.

3 a Give a simple theory of deuteron. Obtain and plot the wave function for the deuteron ground state taken as an S-state.

OR

   b Explain the n-p scattering at low energy. Show how the assumption of spin dependence of nuclear force can explain the experiments results.

4 a What is meant by nuclear resonance? Derive Briet – Wigner one level formula.

OR

   b Define nuclear fission. Obtain an expression neutron diffusion equation.

5 a Explain the classification of elementary particles and conservation laws associated with them.

OR

   b Discuss SU2 symmetry. Explain fundamental interactions among elementary particles.

Z-Z-Z   END