PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)

BSc DEGREE EXAMINATION MAY 2017
(Sixth Semester)

Branch- PHYSICS

NUCLEAR PHYSICS

Time : Three Hours Maximum : 75 Marks

SECTION-A (20 Marks!
Answer ALL questions
ALL questions carry EQUAL marks (10x2 = 20)

1 Define "Isotopes".
2 Define "Mass defect".
3 Give Geiger Nuttal law.
4 Define half life period.
5 Define efficiency of the counter (GM counter).
6 Write the equation for Betatron condition.
7 What is nuclear fusion?
8 Define threshold energy in a nuclear reaction.
9 What are primary cosmic rays? .
10 What are the four types of hyperons?

SECTION - B (25 Marks!
Answer ALL Questions
ALL Questions Carry EQUAL Marks (5x5 = 25)

11 a Explain the Weizasacker's semi empirical formula for binding energy of a nucleus.
OR
b Give the Yukawa's theory, of nuclear forces.

12 a Give the properties of x-rays (gamma).
OR
b Give the Neutrino theory of Beta-decay.

13 a Explain the working of the scintillation counters.
OR
b Explain the working of electron synchrotron.

14 a Give some of the applications of radio - Isotopes.
OR
b Explain the working of an atom bomb.

15 a Explain cosmic ray showers. Discuss cascade theory.
OR
b Explain the classification of elementary particles.

SECTION - C (30 Marks)
Answer any THREE Questions
ALL Questions Carry EQUAL Marks (3 x 10 = 30)

16 Explain the shell model of a nucleus.

17 Define range of alpha particles. Describe an experiment to determine the range of alpha particles.

18 Explain the working of a Betatron with its theory.

19 Explain the construction and functioning of a nuclear reactor.

20 What are elementary particles? Explain elementary particles interactions, its range and particles exchanged in strong, weak, electromagnetic and