PSG COLLEGE OF ARTS & SCIENCE
(AUTONOMOUS)
BSc DEGREE EXAMINATION MAY 2019
(Sixth Semester)

Branch – PHYSICS

NUCLEAR PHYSICS

Time : Three Hours   Maximum : 75 Marks

SECTION-A (20 Marks)
Answer ALL questions
ALL questions carry EQUAL marks   (10 x 2 = 20)

1   What is binding energy?
2   Give the properties of nuclear forces.
3   What is meant by natural radioactivity?
4   Define half – life period.
5   Discuss the principle of ionization chamber.
6   What is dead time in GM counter?
7   What is nuclear fission?
8   Explain stellar energy.
9   What are cosmic rays?
10   What are elementary particles?

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

11 a   Explain the theories of nuclear composition.
OR
    b   Explain stability of nuclei.

12 a   List out the properties of α - Rays.
OR
    b   State and explain Geiger – Nuttal law.

13 a   Discuss the construction and working of ionization chamber.
OR
    b   Explain the photographic emulsion technique.

14 a   What are radio isotopes and list out their applications?
OR
    b   What is controlled fusion? Explain it.

15 a   Explain the latitude effect of cosmic rays.
OR
    b   Write note on leptons, mesons and hyperons.

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

16   Explain in detail about the liquid drop model of the nucleus and using the liquid drop model obtain an expression of Weizacker semi-emprical mass formula. Explain the each term of the formula.

17   Discuss in detail the Gamow's theory of alpha decay. Give the experimental verification of this theory of α - decay.

18   Describe the theory, principle and working of Geiger – Muller counter.

19   Explain with examples, the artificial transmutations. Describe the Rutherford's experiment for the artificial transmutations.

20   Explain in detail about the Quark model.

Z-Z-Z   END