B.Sc. DEGREE EXAMINATION,APRIL 2019
III Year V Semester
Nuclear Physics

Time : 3 Hours **Max.marks :60**

Section A $(10 \times 1 = 10)$ Marks

Answer any **TEN** questions

1. Electrons cannot be present inside the nucleus. Why?
2. Write the expression for nuclear radius.
3. State decay constant.
4. Name the various units of radioactivity.
5. What is a particle accelerator?
6. State the principle of synchrocyclotron.
7. State the principle of ionization chamber.
8. State the advantages of a bubble chamber.
9. Differentiate between primary and secondary cosmic rays.
10. What are particle and antiparticle?
11. Write the condition for acceleration in linear accelerator.
12. Define half-life and mean life.

Section B $(5 \times 4 = 20)$ Marks

Answer any **FIVE** questions

13. Write notes on Fermi gas model of the nucleus.
14. Differentiate between , and rays properties.
15. Explain the working of proton synchrotron.
16. Explain the working of a scintillation counter.
17. Explain the different types of fundamental interaction.
18. Derive an expression for laws of radioactive disintegration.
19. Discuss about cosmic ray showers.

Section C $(3 \times 10 = 30)$ Marks

Answer any **THREE** questions

20. What are magic numbers? Explain how the shell model of nucleus accounts for magic numbers.
21. State Laws of successive disintegration and derive an expression for secular and transient equilibrium.
22. Explain the construction and working of cyclotron.
23. With suitable diagram, explain the construction and characteristics of GM counter. What are its advantages?
24. Explain how the intensity of cosmic rays varies with altitude, latitude and Azimuth effect.

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