Reg. No. | | | | | | | | |

G. VENKATASWAMY NAIDU COLLEGE (AUTONOMOUS), KOVILPATTI – 628 502.

UG DEGREE END SEMESTER EXAMINATIONS - APRIL 2025.

(For those admitted in June 2021 and later)

PROGRAMME AND BRANCH: B.Sc., PHYSICS

SEM	CATEGORY	COMPONENT	COURSE CODE	COURSE TITLE
VI	PART-III	CORE	U21PH612	NUCLEAR PHYSICS

Date & Session: 26.04.2025/FN **Time : 3 hours** **Maximum: 75 Marks**

Course Outcome	Bloom's K-level	Q. No.	SECTION – A (10 X 1 = 10 Marks) Answer ALL Questions.
CO1	K1	1.	Nuclei with half integral spins are known as a) borons b) fermions c) pions d) electrons
CO1	K2	2.	Magic numbers signify a) magnetic moment of nucleus b) density of nucleus c) closed nuclear shell structure d) number of orbital electrons
CO2	K1	3.	Radioactivity is measured in a) becquerel b) curie c) rutherford d) all the above
CO2	K2	4.	In gamma decay a) the parent does not change b) nothing is lost c) the daughter is different from parent d) mass number decreases
CO3	K1	5.	Energy involved in nuclear reactions is of the order of a) keV b) MeV c) eV d) meV
CO3	K2	6.	Controlled thermo nuclear reaction takes place in the medium a) vacuum b) plasma b) magnetic field d) heavy water
CO4	K1	7.	Liquid contained in bubble chamber is a) Propane b) feron c) superheated liquid hydrogen d) any of the above
CO4	K2	8.	Betatron is a machine used to accelerate a) helium atom b) neutrons c) electrons d) all the above
CO5	K1	9.	The intensity of cosmic rays is minimum at a) the equator b) at the polar c) in western countries d) in southern countries
CO5	K2	10.	The down quark has electric charge of a) 2/3 e b) 1/3 e c) -1/3 e d) 1 e

Course Outcome	Bloom's K-level	Q. No.	**SECTION – B (5 X 5 = 25 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	11a.	Describe general properties of nucleus. **(OR)**
CO1	K3	11b.	List out the characteristics of nuclear forces and explain them.
CO2	K3	12a.	What is alpha decay? State its main features. **(OR)**
CO2	K3	12b.	Discuss nuclear isomerism.
CO3	K4	13a.	Find the energy released in fission of one gram of uranium-235. **(OR)**
CO3	K4	13b.	Explain the principle and action of a hydrogen bomb.
CO4	K4	14a.	Describe the construction and working of Geiger-Muller counter. **(OR)**
CO4	K4	14b.	Describe the principle, construction and working of synchro-cyclotron.
CO5	K5	15a.	Explain the formation of Van Allen belts. **(OR)**
CO5	K5	15b.	Explain the connection between symmetry and conservation laws.

Course Outcome	Bloom's K-level	Q. No.	**SECTION – C (5 X 8 = 40 Marks)** **Answer ALL Questions choosing either (a) or (b)**
CO1	K3	16a.	Explain binding energy curve and its significance. **(OR)**
CO1	K3	16b.	Discuss in detail liquid drop model of nucleus.
CO2	K4	17a.	Deduce the laws of radioactive disintegration. **(OR)**
CO2	K4	17b.	Explain Mossbauer effect and its applications.
CO3	K4	18a.	Obtain an expression for Q value for nuclear reaction and deduce threshold energy for the reaction. **(OR)**
CO3	K4	18b.	Describe the working of a nuclear reactor
CO4	K5	19a.	Describe the construction and working of bubble chamber. What are its special features? **(OR)**
CO4	K5	19b.	Explain the construction and working of a cyclotron.
CO5	K5	20a.	With the aid of graphical sketch, describe (i) latitude and (ii) attitude effects on cosmic rays. **(OR)**
CO5	K5	20b.	Explain the four fundamental interactions in nature.