BIRLA INSTITUTE OF TECHNOLOGY, MESRA, RANCHI
(MID SEMESTER EXAMINATION MO/SP20)**

CLASS: IMSc **SEMESTER :VI**
BRANCH: PHYSICS **SESSION : SP2023**

SUBJECT: PH318 INTRODUCTION TO NUCLEAR AND PARTICLE PHYSICS
TIME: 02 Hours **FULL MARKS: 25**

INSTRUCTIONS:
1. The question paper contains 5 questions each of 5 marks and total 25 marks.
2. Attempt all questions.
3. The missing data, if any, may be assumed suitably.
***4*. Tables/Data handbook/Graph paper etc., if applicable, will be supplied to the candidates**

			CO	BL
Q.1(a)	A nucleus with A=235, splits into two nuclei whose mass numbers are in the ratio 2:1, Find radii of the new nuclei.	[2]	1	I
Q.1(b)	Discuss briefly Astons mass spectrograph.	[3]	1	VI
Q.2(a)	Name the main assumptions of liquid drop model of the nucleus.	[2]	1	I
Q.2(b)	Using the semiempirical mass formula, determine the most stable isobar for a nucleus having odd A. (a_3=0.58 MeV, a_4=19.3MeV)	[3]	1	V
Q.3(a)	Explain magic numbers of nuclei?	[2]	1	2
Q.3(b)	What are the evidence for shell structure of the nucleus?	[3]	1	I
Q.4(a)	Discuss the salient features of beta-ray spectra.	[2]	2	VI
Q.4(b)	Explain how Pauli's hypothesis of neutrino beta particle emission solved the anomalies in the beta-ray spectra?	[3]	2	II
Q.5(a)	Distinguish between elastic and inelastic scattering.	[2]	2	IV
Q.5(b)	What is nuclear reactions? Explain exoergic and endoergic reactions?	[3]	2	II

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