Sanjay Ghodawat University, Kolhapur

Established as State Private University under Govt. of Maharashtra. Act No XL, 2017

2020-21

EXM/P/09/00

Year and Program: 2020-21 B.Sc.	**School of Science**	**Department: Physics**
Course Code: PHS306	**Course Title: Atomic & Nuclear Physics**	**Semester: VI**
Day and Date: Monday, 31.05.2021	**End Semester Examination**	**Time:2 Hrs. Max Marks:50**

Instructions: 1) All Questions are compulsory.

		Marks	Bloom's Level	CO
Q.1	**Attempt the following questions.**			
a)	i) State and explain intensity rules for doublets.	4	L3	CO1
	ii) Explain characteristics of alkali spectra.	4	L3	
b)	i) Explain with neat diagram Zeeman splitting of spectral line corresponding to $^1D_2$-$^1P_1$.	4	L2	CO2
	ii) Explain the fine structure on the basis of electron spin.	4	L2	CO1
	OR			
b)	Give quantum mechanical explanation of normal Zeeman effect.	8	L2	CO2
Q.2	**Attempt the following questions.**			
a)	i) Classify nuclei upon different atomic number, mass number and number of neutrons	4	L3	CO3
	ii) Alpha particles of energy 4 MeV approach the gold nucleus. Find the distance of closest approach.	4	L3	
b)	Discuss each term in the semi-empirical formula.	8	L2	CO3
	OR			
b)	State law of radioactive disintegration. Hence obtain equation for mean and half life time	8	L2	CO3
Q.3	**Attempt the following questions.**			
a)	Classify Nuclear reactor according to characteristics of chain reaction.	9	L1	CO4
b)	What is nuclear fusion? Explain P-P cycle and C-N cycle.	9	L1	CO4
	OR			
b)	What is cyclotron? Give theory of cyclotron.	9	L1	CO4

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