

Government Degree College for Women(A), Srikakulam.

B.Sc. PHYSICS SYLLABUS UNDER CBCS

MAJOR [2023-24 Batch onwards]

II Year B.Sc.-Physics IV Semester

Course 10: MODERN PHYSICS

Work load: 45 hrs per semester

3

hrs/week

• BLUE PRINT FOR QUESTION PAPER SETTER

TIME : 3 hrs

Max.Marks :75

SL.N o.	UNIT NO. /CHAPTER NO.		SHORT ANSWER QUESTIONS 5 MARKS	ESSAY QUESTIONS 8 MARKS	MARKS ALLOETD TO THE UNIT
1	I	Introduction to atomic structure and spectroscopy	1+1problem	1	26
2	II	Molecular structure and spectroscopy	2	2	26
3	III	Matter waves and Uncertainty principle	1+1 problem	2	26
4	IV	Quantum mechanics	1+1 problem	2	26
5	V	Superconductivity	2	2	26
	total		50 marks	80marks	130 marks

Note: 1.The question paper setters are requested to kindly adhere to the format given in the above table. 2.The question paper setters are also requested to set the questions based on problems (conceptual or numerical).

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1. The question paper setters are requested to kindly adhere to the format given in the above table.
2. The question paper setters are requested to follow revised Bloom's Taxonomy model while preparing Question paper.
3. The question paper setters are also requested to set the questions in the following way:
 - a. 75 % of Questions - Memory and Understanding based
 - b. 20 % of Questions – Application, Analysis and Skill based
 - c. 5 % of Questions – Creativity and Evaluation based

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MODEL QUESTION PAPER

Max marks : 60 M

SECTION-A

(Essay Type Questions) *Marks : 5x8M = 40M*

Answer All questions with internal choice from each Unit

1A] describe the Stern-Gerlach experiment with theory how does it confirm the vector atom model?

OR

B] Describe the vector atom model? and explain the different quantum numbers associated with it?

2A] What is Raman Effect?and Explain experimental procedure of Raman Effect with neat diagram?

OR

B]Describe in detail the different sources of excitation in UV,visibel and infrared regions in a brief manner?

3A] Describe the De-Broglie theory of matter waves and how was it experimentally verified?

OR

B] What is Heisenberg uncertainty principle? and give one illustration of uncertainty principle using diffraction of beam of electrons?

4.A] Derive Schrodinger Time Independent wave equation for matter waves?

OR

B] Derive an expression for the energy levels of a particle enclosed within infinite one dimensional potential box?

5A] Explain superconductivity phenomenon? And explain BCS theory of superconductivity?

OR

B. Explain about London Equation and its penetration depth?

SECTION-B

(Short Answer Type Questions)

Marks : 5x4M = 20 M

Answer any five out of the following ten questions

6. Describe LS and JJ coupling schemes

7. *The wavelength of the first line in Paschen series of Hydrogen is 1.875×10^{-6} m. Find the value of Rydberg Constant?*

8. Explain about quantum theory of Raman?

9. Write short note on rotational and vibrational spectra?

10. *Calculate the energy in eV of an electron wave of $\lambda = 3 \times 10^{-2}$ m*

11. Explain Heisenberg uncertainty of energy and time?

12. what are Eigen functions and Eigen values?

13. *Calculate the least energy of an electron moving in the dimension in an infinitely high potential box of width 1°A , given mass of the electron 9.11×10^{-31} kg and $h = 6.625 \times 10^{-34}$ Js.*

14. explain about Meissner effect ?

15. Write any five applications of superconductors?

[Note: Question Paper setters are instructed to add Numerical Problems with a maximum weightage of 20 marks either in Section-A or Section-B covering all the five units in the syllabus]
