

Enrollment No: _____ Exam Seat No: _____

C. U. SHAH UNIVERSITY

Summer Examination-2022

Subject Name : Elements of Modern Physics

Subject Code : 4SC03EMP1

Branch: B.Sc. (Physics, Chemistry)

Semester : 3

Date : 29/04/2022

Time : 02:30 To 05:30

Marks : 70

Instructions:

- (1) Use of Programmable calculator & any other electronic instrument is prohibited.
 - (2) Instructions written on main answer book are strictly to be obeyed.
 - (3) Draw neat diagrams and figures (if necessary) at right places.
 - (4) Assume suitable data if needed.
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Q-1 Attempt the following questions: (14)

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|--|----|
| a) List the states of matter. | 01 |
| b) What is the value of Planks constant? | 01 |
| c) What is conduction band? | 01 |
| d) Define valence band. | 01 |
| e) What is Crompton scattering? | 01 |
| f) What do you mean by Photon? | 01 |
| g) What is Photoelectric effect? | 01 |
| h) State the Heisenberg uncertainty principle. | 01 |
| i) Name the constituents of nucleus. | 01 |
| j) Define interference. | 01 |
| k) What do you mean by binding energy? | 01 |
| l) What is nuclear force? | 01 |
| m) What do you mean by quantum mechanical tunneling? | 01 |
| n) What are gamma rays? | 01 |

Attempt any four questions from Q-2 to Q-8

Q-2 (14)

What do you mean by matter wave? Explain De Broglie wavelength with suitable diagram with necessary formulations.

Q-3 (14)

Explain Davisson German experiment in context of wave nature of electron.

Q-4 (14)

Write a note on Semi Empirical Mass Formula and write necessary formulation.



- Q-5** Explain Rutherford's experiment with necessary diagram, its interpretation of structure of atom with drawbacks. **(14)**
- Q-6** **Attempt all questions** **(14)**
- a) What is Schrodinger wave equation and explain its usefulness. **06**
- b) Explain in detail the meaning of normalization and probability. **08**
- Q-7** Write a note on two slit experiment with necessary diagram. **(14)**
- Q-8** What do you mean by superposition of waves? Explain superposition of two waves with necessary diagram and formulation. **(14)**

