

# C.U.SHAH UNIVERSITY

## Summer Examination-2019

**Subject Name: Elements of Modern Physics**

**Subject Code: 4SC03EMP1**

**Branch: B.Sc. (All)**

**Semester: 3**

**Date: 27/03/2019**

**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)**

- a) What is the value of Plank constant?
- b) What is three state of matter?
- c) What is semiconductor?
- d) Define Photons and phonons.
- e) How many types of interference.
- f) What is binding energy?
- g) What is the velocity of light in m/s?
- h) What is scattering phenomenon?
- i) What is kinetic energy?
- j) What is momentum?
- k) Which type radiation emit by body at low temperature?
- l) What are X rays?
- m) What is atomic weight?
- n) What is work function?

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

**Q-2 Attempt all questions (14)**

- (a) Explain the Photoelectric effect with figure of experimental arrangement. 7
- (b) What is Compton effect? Explain this phenomenon by scattering from a cubic crystal. 7

**Q-3 Attempt all questions (14)**

- (a) What is the energy level? Explain the Balmer and Paschen series for emission of spectrum. 7
- (b) An electron has a de Broglie wavelength of  $2 \times 10^{-12}$  m, find its kinetic energy 7

**Q-4 Attempt all questions (14)**

- (a) What is the wave particle duality, Explain? 7
- (b) What is the NZ graph, explain with suitable graph? 7

**Q-5 Attempt all questions (14)**



- (a) Explain the nature of nuclear forces. 7
- (b) Explain the estimation of minimum energy confining particle by uncertainty rule. 7
- Q-6** **Attempt all questions** (14)
- (a) What is interference? Explain the types of interference in terms of maxima and minima. 7
- (b) Explain superposition principle for two or more waves. 7
- Q-7** **Attempt all questions** (14)
- (a) What is Schrodinger wave equation? Why it's useful. 7
- (b) Explain the physical interpretation of wave function. 7
- Q-8** **Attempt all questions** (14)
- (a) What is tunneling of particles across the one rectangular potential barrier? Explain. 7
- (b) What is quantum dots? Explain quantum dot with example. 7

