

# C.U.SHAH UNIVERSITY

## Summer Examination-2017

**Subject Name: Physics-II**

**Subject Code: 4SC02PHC1**

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

**Semester: 2**

**Date: 06/05/2017**

**Time: 02:00 To 05:00**

**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) Define Doppler effect
- b) Give an expression connecting Half Life Time ' $T$ ' and Decay Constant ' $\lambda$ ' for a radioactive element.
- c) What is the difference between Isotopes and Isotones?
- d) Draw and define: Unit cell.
- e) Define Musical sound
- f) Write Bragg's formula for X-ray diffraction.
- g) What is threshold intensity of sound? Give its value with unit.
- h) Give examples for crystalline and non-crystalline solids.
- i) Abbreviate LED and draw its symbol
- j) Define: Ripple Factor -  $\gamma$ .
- k) Draw symbolically P-N-P and N-P-N transistors
- l) Define Bravais lattice.
- m) Define Anisotropy.
- n) State the working principle of a photodiode

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

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

- a. How Longitudinal waves are different from Transversal waves? Give examples. **06**
- b. List the properties of X-rays. **08**

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

- a. Compare the properties of  $\alpha$ ,  $\beta$  and  $\gamma$  radiations. **07**
- b. Describe production of X-rays using a Coolidge Tube with necessary diagrams. **07**

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

- a. State and explain the Laws of Radioactivity **05**
- b. Calculate sound velocity in water if its bulk modulus is  $2.23 \times 10^9 \text{ Pa}$ . **04**
- c. Derive Newton's formula for velocity of sound in air applying Laplace's Correction to it. **05**



- Q-5**            **Attempt all questions**            **(14)**
- a. Discuss Full wave Center Tap rectifier in detail.            **07**
  - b. Write a short note on Zener Diode.            **07**
- Q-6**            **Attempt all questions**            **(14)**
- a. Explain how do multi-colour LEDs work?            **06**
  - b. What is Bravais Lattice? Describe 14 Bravais lattices of 7 crystal systems with lattice parameters and diagrams.            **08**
- Q-7**            **Attempt all questions**            **(14)**
- a. Explain the working of a P-N-P transistor.            **07**
  - b. Describe Common Base Transistor configuration with circuit diagram. Explain its I/P & O/P characteristic curves.            **07**
- Q-8**            **Attempt all questions**            **(14)**
- a. What are Miller Indices? Illustrate the steps to find out Miller indices of a Crystal plane with necessary diagram.            **07**
  - b. Give mathematical analysis of a Full Wave Rectifier.            **07**

