Enrollment No: _____ Exam Seat No:_____

C.U.SHAH UNIVERSITY

Summer Examination-2017

Subject Name: Physics - II

Subject Code: 4SC02PHY1 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.

Q-1 Attempt the following questions: (14)

a) What is Bragg's Law? Give its formula.
b) Define Ripple factor.
c) Define Filter circuit. Name the different types of filter circuits.
d) Write any two applications, each of L.E.D and Photo diode.
e) Define a unit cell with the help of a figure.
f) What are lattice parameters?
g) Define Miller indices.
h) Which effects are noticed when a substance is heated?
i) Define specific heat and give its S.I. unit.
j) What do you know about P-type and N-type of semiconductors?
k) Define the Critical velocity of fluids.
l) Define Mechanical waves.
m) Name any two types of Full Wave Rectifiers.
n) Draw the planes in cubic crystal having Miller Indices : (0 1 1) (1 1 1)

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

Q-2 Attempt all questions (14)

a) Distinguish between Longitudinal Waves and Transverse Waves **(04)**
b) Derive the formula for velocity and frequency of transverse waves along a stretched string. **(05)**
c) Discuss Melde's experiment for longitudinal and transverse modes of vibration. **(05)**

Q-3 Attempt all questions (14)

a) Distinguish between Crystalline solids and Amorphous solids. **(04)**
b) Explain "The 7 Crystal Systems & 14 Bravais Lattices" with diagrams. **(06)**
c) Distinguish between Streamline fluid-flow and Turbulent fluid-flow **(04)**

Q-4 Attempt all questions (14)

a) Discuss: Properties and characteristics of X-rays. **(05)**

	b)	With a neat diagram, explain the production of X-rays using a Coolidge Tube.	**(05)**
	c)	For X-ray production, a Coolidge tube is operated on 50 kV, find the following (i) Maximum velocity for emitted electrons striking the target. (ii) Minimum wavelength of X-rays produced.	**(04)**
Q-5		**Attempt all questions**	**(14)**
	a)	What is a P-N junction diode? Discuss the Forward and Reverse biasing of a diode with circuit diagrams and explain its characteristics.	**(07)**
	b)	What is a rectifier? Explain a full wave rectifier in detail with the help of a circuit diagram giving its construction, working and mathematical analysis.	**(07)**
Q-6		**Attempt all questions**	**(14)**
	a)	Explain the working of a NPN or a PNP transistor with the help of a proper diagram.	**(04)**
	b)	Name the different types of transistor configurations. Discuss in detail any one of them.	**(06)**
	c)	In a Common Base connection, the current amplification factor is 0.9. If the emitter current is 1 mA, determine the Collector current and Base current.	**(04)**
Q-7		**Attempt all questions**	**(14)**
	a)	Discuss in detail the Principle-Construction-Circuit Diagram-Working-Characteristic Graph-Voltage & Current formula, Advantages and Disadvantages of Light Emitting Diodes.	**(07)**
	b)	Discuss in detail the Principle-Construction-Circuit Diagram- Working and Characteristic graphs of Photo –Diodes.	**(05)**
	c)	What value of series resistance is required to limit the current through a LED to 20 mA with a forward voltage drop of 1.5 V when connected to a 10 V supply.	**(02)**
Q-8		**Attempt all questions**	**(14)**
	a)	Discuss: Newton's law of cooling.	**(04)**
	b)	Discuss Stoke's law and derive its formula. Discuss the measurement of viscosity by Stoke's method.	**(06)**
	c)	Write a short note on Reynold's number.	**(04)**