

Enrollment No: \_\_\_\_\_

Exam Seat No: \_\_\_\_\_

# C. U. SHAH UNIVERSITY

## Winter Examination-2022

Subject Name : Waves and Optics

Subject Code : 4SC04WAO1

Branch: B.Sc. (Chemistry, Mathematics)

Semester: 4

Date: 23/09/2022

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.

---

<b>Q-1</b>	<b>Attempt the following questions:</b>	<b>(14)</b>
	a) What do you mean by a Zone plate?	01
	b) Whose angle of deviation is minimum?	01
	c) Explain Monochromatic wave.	01
	d) What is single slit?	01
	e) What is EM wave?	01
	f) What is refractive index?	01
	g) State Huygen's principle.	01
	h) What are the types of interference?	01
	i) What are the types of wavefront?	01
	j) Explain the nature of light.	01
	k) Define: Beats.	01
	l) Define: Diffraction.	01
	m) Define: Wavelets.	01
	n) Define: Polarisation.	01

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

<b>Q-2</b>	<b>Attempt all questions</b>	<b>(14)</b>
	a) Describe the construction and theory of zone plate.	07
	b) Derive Newton's rings and its formation.	07
<b>Q-3</b>	<b>Attempt all questions</b>	<b>(14)</b>
	a) Discuss Doppler effect.	07
	b) Explain interference by reflected light.	07
<b>Q-4</b>	<b>Attempt all questions</b>	<b>(14)</b>
	a) Explain in detail the principle, construction and working of a Fresnel biprism with suitable figure.	07
	b) Explain the image formation in Lloyd's Mirror.	07



- Q-5**            **Attempt all questions**            **(14)**
- a) Derive an equation of velocity of sound in a solid material.            **08**
- b) Explain the Fraunhofer diffraction and intensity pattern at single slit with proper figure.            **06**
- 
- Q-6**            **Attempt all questions**            **(14)**
- a) Briefly explain the Young's double slit experiment.            **08**
- b) Explain with suitable diagram the Huygen's principle.            **06**
- 
- Q-7**            **Attempt all questions**            **(14)**
- a) Explain Intensity distribution in diffraction pattern due to a single slit and method of integral calculus.            **07**
- b) Explain: Wedge shaped thin film.            **07**
- 
- Q-8**            **Attempt all questions**            **(14)**
- a) Discuss missing orders in a double slit diffraction method.            **08**
- b) Explain: Michelson Interferometer.            **06**

