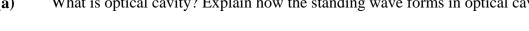
Enrollm	ent No:	Exam Seat No:		
	C.U.SHAH	H UNIVERSITY Examination-2018		
Subject 1	Name: Applied Optics			
Subject (	Code: 4SC04APO1	Branch: B.Sc. (Chemistry,	Branch: B.Sc. (Chemistry, Physics)	
Semestei	r: 4 Date: 08/05/2018	Time: 10:30 To 01:30	Marks: 70	
(2) I (3) I		•	s prohibited.	
	Attempt the following question	ns:	(14)	
a)	Define term Absorption of light.			
<b>b</b> )	Define optical Modes.			
c) d)	Write the formula for acceptance What are advantages of optical f	_		
e) f)	Which region has higher refracti Write any two applications of La	<u> </u>		
g)	Write the formula for NA.			
h)	Write the formula of rate of abso	orption transition.		
i)	Write the formula of rate of stim	nulated transition.		
<b>j</b> )	What is the difference between a	multimode and mono mode.		
k)	Write the formula of rate of spor	ntaneous emission.		

- 1) What is the separation of natural light with laser light?
- m) In which process resulting emitted light is not monochromatic.
- **n**) Give an example of gas laser.

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

Q-1

Q-2 Attempt all questions (14)
(a) What is optical cavity? Explain how the standing wave forms in optical cavity. 7





	<b>(b)</b>	Explain the condition for stimulated emission to dominate spontaneous emission.	
Q-3	(a)	Attempt all questions Explain the pumping scheme for laser action	(14) 8
	<b>(b)</b>	Explain population inversion in the production of laser.	6
Q-4	(a)	Attempt all questions Explain the principle and working of a He-Ne laser.	
	<b>(b)</b>	Explain the principle and working of Nd-YAG laser.	7
Q-5	(a)	Attempt all questions Explain the principle and cross sectional view of fiber optics. What is the proper diameter of all the three regions?	(14) 8
	(b)	What are the differences between step index and graded index fiber? Explain with suitable figure.	6
Q-6	(a)	Attempt all questions In an optical fiber, the core material has refractive index 1.1 of clad material is 1.3.what is the value of critical angle? Also calculate the value of angle of acceptance.	(14) 7
	(b)	Calculate the numerical aperture and acceptance angle of an optical fiber from the following data: $n_1$ (core)=1.55 and $n_2$ (cladding) =1.50	7
Q-7	(a)	Attempt all questions Explain the spatial frequency filtering concept of Fourier optics.	(14) 7
	<b>(b)</b>	Explain the Fourier transforming property of a thin lens.	7
Q-8	(a)	Attempt all questions Explain operation and principle of Holography, briefly	(14) 6
	<b>(b)</b>	Explain the construction and formation of image by Holography technique	8

