	Enrollm	ent No:		Exam Seat No:		_		
			C.U.SHAH	UNIVERSITY				
	Summer Examination-2017							
	Subject 2	Name: Las	ser and Fiber optics					
	Subject Code: 4SC04PHC2			Branch: B.Sc. (All)				
	Semeste	r: 4	Date: 26/04/2017	Time: 10:30 To 01:30	Marks: 70			
	Instruction	ons:						
	(1)	Use of Prog	grammable calculator & an	y other electronic instrument is p	rohibited.			
				ook are strictly to be obeyed.				
			diagrams and figures (if ne	cessary) at right places.				
	(4)	Assume sur	itable data if needed.					
Q-1		Attempt	the following questions:			(14)		
	a)	Give the	full form of LASER.					
	<b>b</b> )		the applications of Hologr	aphy?				
	c)		e the three main parts of ar	- ·				
	d)	What is I	Pumping?					
	e)		letastable state.					
	<b>f</b> )		s light travel in an optical f					
	<b>g</b> )		e the processes by which li					
	<b>h</b> )		actional refractive index ch	aange.				
	i) j)		Holography? hologram different from a	a ordinary photograph?				
	<b>k</b> )		process is a hologram rec					
	l)	•	e the two main types of an					
	<b>m</b> )		e term resonant energy trai	<u> </u>				
	n)		Mode of propagation of o					
Atte	mpt any	four quest	ions from Q-2 to Q-8					
Q-2		Attemnt	all questions			(14)		
<b>~</b> -	(a)	_	_	of propagation with appropriate	diagrams.	(07)		
	( <b>b</b> )	-	-	nd spontaneous emission of light	_	(07)		
Q-3		-	all questions	-	C	<b>(14)</b>		
	<b>(a)</b>	-	Nd-YAG Laser with diagra			(06)		
	<b>(b)</b>		7	g schemes? Explain three level pu	ımping.	(04)		
	<b>(c)</b>		-	e principle on which it works.		(04)		
Q-4		Attempt	all questions			<b>(14)</b>		



Derive the Einstein relations and hence prove that the ratio of the coefficients of

spontaneous to stimulated emission is proportional to the third power of the

(a)

**(b)** 

**(c)** 

frequency of radiation.

Define stimulated emission.

Write a short note on population inversion.

**(07)** 

(04)

(03)

Q-5		Attempt all questions	(14)
	(a)	Explain the fiber optic communication system with a neat diagram.	(07)
	<b>(b)</b>	Explain the principle on which holography works. Explain the process of	(07)
		constructing a hologram with appropriate diagram.	
<b>Q-6</b>		Attempt all questions	(14)
	(a)	Gives the application of optical fiber.	(06)
	<b>(b)</b>	Explain the principle, construction and working of a Ruby Laser with a neat	(08)
		diagram.	
Q-7		Attempt all questions	(14)
	(a)	Give the difference between single mode and multimode fiber.	<b>(07)</b>
	<b>(b)</b>	Define a hologram. Explain the process of reconstruction of a hologram.	<b>(07)</b>
Q-8		Attempt all questions	(14)
	(a)	Explain the working of semiconductor Lasers.	<b>(07)</b>
	(h)	Derive the formula for acceptance angle with a neat diagram	(07)

