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GUJARAT TECHNOLOGICAL UNIVERSITY

Subject Code: 110011 Subject Name: Physics

BE- SEMESTER 1st / 2nd EXAMINATION (OLD SYLLABUS) - SUMMER - 2017

Date:30/05/2017

Time: 2:30 PM to 05:00 PM			Total Marks: 70	
Inst	2.	ons: Attempt any five questions. Make suitable assumptions wherever necessary. Figures to the right indicate full marks.		
Q.1	(a)	Answer the following questions. [One mark each] 1. Classify the sound waves based on frequency. 2. Name the characteristics of musical sound. 3. Expand the term: 'SONAR'. 4. What is NDT? 5. Give one example of gaseous state laser. 6. Define: Metastable State. 7 is three dimensional photography.		07
	(b)	Answer the following questions. [One mark each] 1. Give two conditions for Total Internal Reflection. 2. State the main components of optical fiber communication system. 3. What is transition temperature for Mercury? 4. What is a 'SQUID'? 5. What is metallic glass? 6. Give any two applications of Biomaterials. 7. What are Nanomaterials?		07
Q.2	(a) (b)	What is Meissner effect ? Show that Superconducting material is do in nature and obtain χ_m = -1 for superconductors. 1. Write applications of ultrasonic waves. 2. Calculate the NA and acceptance angle of the fiber having n_1 n_2 = 1.45.	C	07 04 03
Q.3	(a) (b)	Describe the construction and working of Nd-YAG laser with a suital level diagram. 1. List the differences between step index and graded index optical file. 2. Calculate the critical current through a long thin superconduction radius 0.5 mm. The critical magnetic field is 7.2 kA/m.	ber.	07 04 03
Q.4	(a) (b)	Define: Intensity (I) and Intensity level (I _L) for sound wave. Show the in intensity level of 1 dB alters the intensity by 26%. 1. Write a short note on Biomaterials. 2. The amplitude of a sound wave is doubled. By how many of intensity level will increase?		07 04 03
Q.5	(a) (b)	Define and discuss the factors: reverberation, loudness, echelon noise that affect the acoustics in a hall and the remedies for them. 1. Write the applications of LASER in engineering. 2. An ultrasonic source of 0.09 MHz sends down a pulse towards which returns after 0.55 sec. The velocity of sound in sea water is Calculate the depth of the sea and wavelength of the pulse.	the seabed	07 04 03

Q.6	(a)	What do you mean by acceptance angle and numerical aperture of a fiber?	07
		Derive expressions for them (with diagram).	
	(b)	 What are shape memory alloys? Describe temperature induced shape memory alloy in detail (with diagram). Explain the Sol gel technique to prepare Nanomaterials. What are the advantages of this method? 	04 03
Q.7	(a)	Describe the principle and the method of producing ultrasonic waves by magnetostriction method (with diagrams).	07
	(b)	1. Properly explain the advantages of optical fiber communication system.	04
		2. Distinguish between the loudness and intensity of sound.	03
