Q.P. Code: 18HS0849 **R18**

Reg. No: | | | | | | | | | | |

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations June 2019

PHYSICS

(Electrical and Electronics Engineering)

Time: 3 hours Max. Marks: 60

PART-A

(Answer all the Questions **5 x 2 = 10** Marks)

1	**a**	Define Mechanical oscillation?	2M
	b	What is acronym of LASER and MASER?	2M
	c	Mention any two properties of matter waves?	2M
	d	What is Fermi level? Locates its position for intrinsic semiconductor?	2M
	e	Write allotropes of Carbon?	2M

PART-B

(Answer all Five Units **5 x 10 = 50** Marks)

UNIT-I

2	**a**	What are the characteristics of simple harmonic oscillator?	2M
	b	Explain different types of vibrations?	8M
		OR	
3	**a**	Describe equations of forced vibrations?	4M
	b	Describe the amplitude and phase of forced vibrations?	6M

UNIT-II

4	**a**	Explain the population inversion?	5M
	b	Explain the various pumping mechanisms?	5M
		OR	
5	**a**	Explain the construction and working of Nd-YAG laser with suitable energy level diagram?	8M
	b	Mention the advantages of Nd-YAG laser?	2M

UNIT-III

6	**a**	State and Explain de-Broglie hypothesis of matter waves?	8M
	b	Mention its properties?	2M
		OR	
7	**a**	Derive Schrodinger's time dependent wave equation?	7M
	b	An electron is moving under a potential field of 1.5kv. Calculate the wavelength of electron wave?	3M

UNIT-IV

8	**a**	Explain the origin of energy bands in solids?	6M
	b	Using free electron model derive an expression for electrical conductivity in metal?	4M
		OR	
9	**a**	Describe the hall effect in a semiconductor?	8M
	b	Write short note on applications of Hall effect?	2M

UNIT-V

10	**a**	Explain Sol-Gel technique for synthesis of Nano materials?	7M
	b	Mention the important advantages of sol-gelproces?	3M
		OR	
11	**a**	What is a Nano material? Write the classification of Nano materials?	4M
	b	Explain the basic principle of Nano materials?	6M

END