Q.P. Code: 18HS0848 **R18**

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

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR

(AUTONOMOUS)

B.Tech I Year I Semester Supplementary Examinations June 2019

PHYSICS

(Common to CE & AGE)

Time: 3 hours Max. Marks: 60

PART-A

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

1	**a**	Define vector and scalar and give two examples.	2M
	b	Delineate the term Coriolis force.	2M
	c	What are damped oscillations?	2M
	d	Define elasticity and plasticity.	2M
	e	What is nanoscience and nanotechnology?	2M

PART-B

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

UNIT-I

2	**a**	Define vector product of vectors and give its properties.	7M
	b	Vectors is given by A=4ĵ-7ǩ, by B=5î+3ĵ find out the sine angle between them.	3M
		OR	
3	**a**	Explain the principle of working of a rocket	3M
	b	Derive an equation for the final velocity of the rocket and its special cases.	7M

UNIT-II

4	**a**	Distinguish between inertial and non inertial frames.	6M
	b	Calculate the magnitude and direction of the coriolis force on mass of ice $5x10^8$ kg near the north pole moving west at the rate of 0.02 meter per sec. (Angular velocity of rotation of earth is $0.727x\ 10^{-4}$ rad per sec)	4M
		OR	
5	**a**	Write the brief note on effect of coriolis force on weather systems.	6M
	b	If an object is dropped from height of 200 metres at latitude 45^o, calculate the magnitude of deflection.	4M

UNIT-III

6	**a**	What is simple harmonic oscillator?	3M
	b	Obtain the expressions for characteristics of SHM such as velocity, time period and frequency through solution of equation for simple harmonic oscillator.	7M
		OR	
7	**a**	Derive the equation of motion of damped harmonic oscillator.	5M
	b	Obtain the solution for equation of damped harmonic oscillator.	5M

UNIT-IV

8	**a**	Explain the classification of beams.	7M
	b	Find the work done in stretching a wire of cross-section 1.25 mm^2 and length 0.14 mm. the Young's modulus of wire is 45 GN/m^2.	3M
		OR	
9	**a**	Derive the relation between rigidity modulus (η) and Young's modulus (Y).	7M
	b	Calculate Poisson's ratio for sliver. Given its Young's modulus=7.25×10^{10} N/m^2 and bulk modulus =11×10^{10} N/m^2.	3M

UNIT-V

10	**a**	What are carbon nanotubes? Mention its structures?	5M
	b	Write brief note on applications of carbon nanotubes.	5M
		OR	
11	**a**	What is graphene?	3M
	b	Write brief note properties and applications of graphene in various fields.	7M

END