

Reg. No: 

--	--	--	--	--	--	--	--	--	--

SIDDHARTH INSTITUTE OF ENGINEERING & TECHNOLOGY:: PUTTUR  
(AUTONOMOUS)

B. Tech I Year I Semester Supplementary Examinations FEB-2021

PHYSICS

(Common to CE &amp; AGE)

Time: 3 hours

Max. Marks: 60

**PART-A**

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

- |   |   |                                                                   |    |
|---|---|-------------------------------------------------------------------|----|
| 1 | a | Define force. List the basic forces in nature.                    | 2M |
|   | b | Distinguish between inertial and non-inertial frame of reference. | 2M |
|   | c | What is resonance? Give any two natural examples of resonance     | 2M |
|   | d | Define the terms i) Stress and ii) Strain.                        | 2M |
|   | e | Write the allotropes of carbon.                                   | 2M |

**PART-B**

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

**UNIT-I**

- |   |   |                                                                                                                     |    |
|---|---|---------------------------------------------------------------------------------------------------------------------|----|
| 2 | a | Define vector products of vectors. Give their properties.                                                           | 5M |
|   | b | Two vectors $A = 3i+4j-k$ , $B = 2i+j+4k$ , then calculate the cross product of resultant vector and its magnitude. | 5M |

**OR**

- |   |   |                                                                                |    |
|---|---|--------------------------------------------------------------------------------|----|
| 3 | a | Explain the working principle of rocket.                                       | 3M |
|   | b | Derive an equation for final velocity of a rocket. Discuss with special cases. | 7M |

**UNIT-II**

- |   |   |                                                                                   |    |
|---|---|-----------------------------------------------------------------------------------|----|
| 4 | a | Distinguish between centripetal and centrifugal forces acting on a rotating body. | 6M |
|   | b | Explain rotating frame of reference.                                              | 4M |

**OR**

- |   |   |                                                              |    |
|---|---|--------------------------------------------------------------|----|
| 5 | a | Describe the effect of Coriolis force on the weather system. | 5M |
|   | b | Give the examples for centrifugal and Coriolis forces.       | 5M |

**UNIT-III**

- |   |   |                                                                        |    |
|---|---|------------------------------------------------------------------------|----|
| 6 | a | Develop the expression for the motion of a damped harmonic oscillator. | 5M |
|   | b | Obtain the solution for the equation of a damped harmonic oscillator.  | 5M |

OR

- 7 a Distinguish between forced vibrations and free vibrations. 5M  
b A particle of mass 10 gm executing SHM with a amplitude of 8 cm. If it make 16 vibrations per second, find the maximum velocity. 5M

**UNIT-IV**

- 8 a What is Hook's law? Describe the behavior of a wire with increasing load. 5M  
b Explain the various types of beams. 5M

OR

- 9 a Describe the terms rigidity modulus and Poisson's ratio of an elastic materials. 5M  
b State the different type of supports. Explain. 5M

**UNIT-V**

- 10 a Write a brief note on principle of nanomaterials. 5M  
b List the applications of nanomaterials in various fields. 5M

OR

- 11 a Outline the synthesis of nanomaterials by using Sol-gel technique. 6M  
b Give the properties and applications of graphene. 4M

\*\*\*END\*\*\*