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

B.Tech I Year I Semester Regular Examinations January 2020

ENGINEERING PHYSICS

(Common to CE&AGE)

Time: 3 hours

Max. Marks: 60

(Answer all Five Units 5 x 12 = 60 Marks)

UNIT-I

- 1 a Define vector and scalar quantities and give two examples. **4M**
b Define gradient of a scalar field and give its physical significance. **8M**

OR

- 2 a Explain inertial and non-inertial frames of reference **4M**
b Obtain an expression for velocity of a body moving in a rotating frame of reference with constant angular velocity. **8M**

UNIT-II

- 3 a Classify different types of beams. **8M**
b Obtain an expression for the internal energy due to strain. **4M**

OR

- 4 a Define shear strain. Explain how shear strain is related to modulus of rigidity. **8M**
b The Young's modulus for steel is $Y=2 \times 10^{11} \text{N/m}^2$ and its rigidity modulus $\eta=8 \times 10^{10} \text{N/m}^2$. Estimate the Poisson's ratio and its bulk modulus. **4M**

UNIT-III

- 5 a Explain reverberation and reverberation time. **4M**
b Derive Sabine's formula for reverberation time. **8M**

OR

- 6 a Give any four methods for the detection of ultrasonics. **4M**
b Write the applications of ultrasonics. **8M**

UNIT-IV

- 7 a Define damped harmonic motion. Give examples. **4M**
b Derive and solve differential equation of damped harmonic oscillator. **8M**

OR

- 8 a Distinguish between damped and forced oscillations with suitable examples. **4M**
b Explain the phenomenon of resonance and write the applications of resonance in various fields. **4M**
c The frequency of a tuning fork is 300Hz. If its quality factor Q is 5×10^4 , find the time after which its energy becomes (1/10) of its initial value. **4M**

UNIT-V

- 9 a What are nanomaterials? Explain the basic principles of nanomaterials. **8M**
b Outline the properties of nanomaterial that are affected due to increased surface area to volume ratio. **4M**

OR

- 10 a Explain the synthesis of nanomaterial by ball milling method. **8M**
b Discuss the advantages of nanomaterial. **4M**

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