

Roll No. ....

**21191**

**B. Sc. (Pass Course) 2nd Semester  
Examination – May, 2019**

**PHYSICS-I (PROPERTIES OF MATTERS, KINETIC  
THEORY & RELATIVITY)**

Paper : Phy-201

Time : Three Hours ] [ Maximum Marks : 45

*Before answering the questions, candidates should ensure that they have been supplied the correct and complete question paper. No complaint in this regard, will be entertained after examination.*

**Note :** Attempt at least *one* question from each Unit. A student has to attempt *five* questions in all.

**UNIT – I**

1. Define Young's modulus, Bulk modulus, Modulus of rigidity and Poisson's ratio. Write two relation that connect these elastic constants. 9
2. Deduce an expression for the couple per unit twist of a uniform solid cylinder. 9

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3. What is bending moment ? Find an expression for the depression at a point distant  $x$  from the fixed end of a cantilever. 9

#### UNIT – II

4. Consider an ideal gas and by using Maxwell's law for distribution of speed derive the expression for :

- (i) Most probable speed ( $V_m$ ) 3  
 (ii) Average speed ( $V_{av}$ ) 3  
 (iii) Root mean square speed ( $V_{rms}$ ) 3

5. Write notes on the following :

- (i) Brownian motion 5  
 (ii) Free mean path 2  
 (iii) Law of equipartition of energy 2

#### UNIT – III

6. What is length contraction and time dilation ? Derive an expression for proper length and proper time interval. 9

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7. What is rest mass ? Derive an expression for mass energy equivalence.

8. With the help of suitable diagram explain Michelson Morley experiment and its outcome.

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