

2019

B.Sc.

1st Semester Examination

PHYSICS (Honours)

Paper—C 2-P

Full Marks : 20

Time : 3 Hours

*The figures in the margin indicate full marks.  
Candidates are required to give their answers  
in their own words as far as practicable.*

1. Determine the Moment of Inertia of Flywheel.
  - (a) Working Formula. 3
  - (b) Data for the radius of the shaft by slide calliperse (Find v.c. for slide calliperse) 1+2
  - (c) Data for h by meter scale. 1
  - (d) Data for time of fall two different loads. 3
  - (e) Data for number of rotation of the flywheel. 3
  - (f) Calculate the moment of Inertia. 2

2. Determine the Modulus of Rigidity of a wire by Maxwell's needle (Length of the wire will be supplied)

(a) Working Principal 3

(b) Data for the radius of wire by screw gauge.  
(Determine least count for screw gauge) 1+2

(c) Determine the mass of the hollow and solid cylinder. 2

(d) Data for time period for solid cylinders outside the needle and inside the needle ( $T_1$  and  $T_2$ )  
[Measure time for at least 10 oscillation for three observation] 6

(e) Calculate of rigidity modulus. 1

3. Determine the Young's Modulus of a wire by optical lever method. (length of the arm of a optical lever are to be supplied)

(a) Working principle. 3

(b) Data for the radius of the wire by screw gauge. 1+2

- (c) Data for load depression graph (5 loads) by optical lever method. 5
- (d) Draw load depression graph. 2
- (e) Calculation Young's Modulus (Y) from graph. 2
4. Measure the internal diameter of a capillary Tube.
- (a) Screw-gauge and Travelling microscope. 3
- (b) Data for least count of screw gauge. 2
- (c) Data for diameter by screw gauge. 3
- (d) Data for vernier constant of travelling microscope. 7
5. To determine  $g$  by Bar Pendulum.
- (a) Working principal. 3
- (b) Data  $T$  vs  $d$  graph [measure time at least 15 oscillations] 7

[ Turn Over ]

- (c) Draw graph for  $T$  vs  $d$ . 3
- (d) Calculation of  $g$  from graph. 2
6. Determine the elastic constants of a wire by Searle's method. [length and depth of bars will be supplied]
- (a) Working Formula for  $\gamma$ ,  $\eta$  and  $\sigma$ . 4
- (b) Data for the radius of the wire by screw-gauge. 1+2
- (c) Data for Time periods of vertical and horizontal oscillations. (At least 20 oscillations for each) 5
- (d) Calculation of  $\gamma$ ,  $\eta$  and  $\sigma$ . 3
7. Determine the value of  $g$  using Kater's Pendulum.
- (a) Working formula. 3
- (b) Preliminary records of times of oscillations during adjustment of positions of cylinders. 5

- (c) Data for final time periods  $T_1$  and  $T_2$ . 3
- (d) Data for distances  $l_1$  and  $l_2$ . 2
- (e) Calculation of  $g$ . 2
8. To determine  $g$  and velocity for a freely falling body using 'digital timing technique'.
- (a) Theory and working formula. 3
- (b) Recording of height and time ( $T$ ) of free falling for five different heights for first body. 3
- (c) Recording of same for second body of different mass. 3
- (d) Graphs of height ( $h$ ) vs.  $T^2$ . 2
- (e) Determined  $g$  from graph. 2
- (f) Calculation of velocity of falling when touches the surface for both mass [Take and height( $h$ )] 2

9. Determine the height of a vertical distance between two points using sextant.
- (a) Working formula. 2
  - (b) Vernier constant. 2
  - (c) Reading of base point and vertical point for three horizontal distance (d) [by measuring tape or metre scale] 6
  - (d) Table for  $\tan \theta$  vs  $\frac{1}{d}$  graph and plot of the graph. 1+2
  - (e) Calculation of height (h) the graph. 2
10. Determine co-efficient to viscosity of water by capillary flow method (Poiseuille's Method)
- (a) Working Formula. 3
  - (b) Data record for h. 6
  - (c) Calculation with necessary plots. 6

Distribution of Marks

Experiment	15 marks
Laboratory Note book	02 marks
Viva voce	03 marks
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Total	20 marks
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