

2023

B.Sc. (Honours)

PHYSICS

B.Sc. First Semester End Examination - 2023

PAPER - PSHMJ101P

Full Marks : 20

Time : 2 hours

*The figures in the right-hand margin indicate marks.*

*Candidates are required to give their answers in their own words as far as practicable.*

*Illustrate the answers wherever necessary. The figure in the margin indicate full marks. Candidates are required to give their answer in their own words as per as practicable.*

Marks Distribution :

Experiment -15, LNB-2, Viva-voce -3

1. To study the vertical oscillation of a spring and to determine the gravitational acceleration 'g' and spring constant(k).  
[Mass of spring is supplied]
  - a) Working formula. 2
  - (b) Data for mass and elongation of spring. 4
  - (c) Data for the  $m-T^2$  graph (five different loads) 4

(Turn Over)

( 2 )

- (d) Drawing curves. 3
- (e) Calculation of 'g' and spring constant (k). 2
2. To determine the moment of inertia of a Fly Wheel.
- (a) Working formula. 3
- (b) Data for the radius of the shaft by slice callipers. 3
- (c) Data for (length of the thread/height of the bottom of the hanger from ground by meter scale) 1
- (d) Data for time of fall in case of three different loads. 3
- (e) Data for number of rotations of the fly wheel after it gets maximum speed by complete unwinding of the thread and before it stops for the above three loads. 3
- (f) Calculation of the moment of inertia. 2
3. To determine the Young's Modulus of the material of a beam by the method of flexure. [Use any one length between to 80 cm and 100 cm for one side of the beam]
- (a) Working formula. 2
- (b) Readings for the length of the beam by a meter scale. 1
- (c) Readings for the breadth of the beam by Slide Callipers. (at least 3 sets of readings to be taken in each case) 1
- (d) Readings for the depth of the beam by screw gauge. (at

( 3 )

- least 3 sets of readings to be taken in each case) 1
- (e) Data for load and depression by microscope. [Excluding zero load at least six loads to be taken] 6
- (f) Drawing load-depression curve. 2
- (g) Calculation. 2
4. To determine the Co-efficient of viscosity of water by its flow through a capillary tube. The radius of the capillary tube will be supplied. (At least five different pressure difference to be taken)
- (a) Working formula. 2
- (b) Data for height 'h' and volume 'v' 8
- (c) h vs. V graph. 3
- (d) Calculation. 2
5. To 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 the cylinders. 5
- (c) Data for final time periods  $T_1$  and  $T_2$ . 3
- (d) Data for the distances  $l_1$  and  $l_2$ . 2
- (e) Calculation of g. 2