2022

Physics

[HONOURS]
(CBCS)
(B.Sc. First Semester End Examinations-2022)
PAPER-CC2P
(PRACTICAL)

Full Marks: 20   **Time: 02 Hrs**

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

Perform any one experiment.

Experiment : 15+LNB:03+Viva-voce-02

1. To study the vertical oscillation of a spring mass system and to determine the modulus of rigidity 'η' and spring constant.(mass and total length of the spring wire and radius of the spring are to be supplied)

   a) Working formula   3

   b) Data for depression-load graph (For five different loads)   3

   c) Data for m_L-T^2 graph (five different loads)   3

   d) Drawing of graphs.   4

   e) Calculation of η and spring constant from the graph.   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 slide callipers (determine vernier constant and take three readings) 3
   c) Data for length of the thread / height of the bottom of the hanger from ground 1
   d) Data for time (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 3

3. To determine the value of 'g' using bar pendulum
   a) Working formula. 3
   b) Data for T vs d graph [d, the distance of the edge of holes which are far from the centre of the bar is measured by meter scale, measure time for at least 30 oscillations for measuring T] 7
   c) Draw T-d graph 3
   d) Calculation of g from T-d graph 2

4. To determine the value of g using Keter's Pendulam.
   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 distance L_1 and L_2. 2
   e) Calculation of 'g' 2

5. To determine the modulas of rigidity of a wire by Maxwell's needle.(Length of the wire is to be supplied.

   a) Working formula 3
   b) Data for the radius of the wire by screw gauge (determine least count and take three readings). 1+2
   c) Data for mass of solid and hollow cylinders by spring / electronic balance. 2
   d) Data for the time periods for solid cylinders by outside the needle. (T_1 and T_2) (min 20 oscillations. Measuring time periods three observations for each of T_1 and T_2) 6
   e) Calculation of rigidity modulus 1

6. To merasure the external diameter of a tube by slide callipers, screw gauge and travelling microscope.
   a) Data for vernier constant and zero error of slide Calipers. 1
   b) Data for diameter by slide callipers (at least 5 readings) $2\frac{1}{2}$
   c) Data for least count and zero error of screw gauge. 2
   d) Data for diameter by screw gauge (at least 5 readings) $2\frac{1}{2}$
   e) Data for diameter by microscope (vernier constant) at least 3 readings for each of horizontal and vertical diameter. 1+6

7. To determine Co-efficient of viscosity of water by capillary flow method (Poiseuille's method).
   [Radius of the bore and length of the capillary tube to be supplied]
   a) Working formula. 3
   b) Data for h V graph for six different h (least count of measuring cylinder and stopwatch are to be noted). 6+1
   c) Drawing graph. 2
   d) Calculation of n from graph. 2

e) Calculation of maximum proportional error.   2

8. To determine the young's Modulus of a wire by optical Lever method. (Length of the wire and length of the arm of the optical lever are to be supplied).

   a) Working formula and ray diagram.   2+1

   b) Data for the radius of the wire by screw gauge(determine least count and take at least three readings)   1+3

   c) Distance between mirror and the scale.   1

   d) Data for load depression graph with the help of optical lever arrangement. (for five loads)   5

   e) Calculation of Y   2

9. To determine the elastic constants of a wire by Scarle's method (length and bredth / depth of the bars are to be supplied)

   a) Working formula for Y, η, δ.   4

   b) Data for the radius of the wire by screw gauge (determine least count and take at least three readings)   1+2

   c) Data for the length of the wire between the bars by meter scale.   1

   d) Data for time periods of horizontal and vertical oscillation (T1 and T2) of the bars three observations for vertical and three for horizontal, 20 oscillations each observation)   5

   e) Calculation of Y, η, δ 2