U.G. 1st Semester Examination - 2020

PHYSICS

[HONOURS]

Course Code : PHYS-H-CC-P-02

(Mechanics)

[PRACTICAL]

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.

Answer any **four** questions from the following: 5×4=20

1. For a material how many elastic constants are there? Expression of Young modulus is $Y = \frac{4Lg}{\pi d^2}\frac{M}{l}$, terms being as usual. Write the expression for maximum percentage error. Does Y depend on the radius of the wire? 1+3+1

2. What are meant by 'moment of inertia' and 'radius of gyration'? Will the moment of inertia be different if the axis of rotation changes? Does the value of rigidity modulus (n) depend on length and diameter of the wire? 2+2+1

3. Determine the value of Vernier constant for slide calipers and screw gauge. The Vernier zero of slide calipers exactly coincide with 2 cm of main scale and Vernier eight (8) exactly coincide with any one line between 2 cm and 3cm of main scale. Express the total reading in cm. 3+2

4. A simple pendulum has a period 'T' inside a lift when it is stationary. The lift is accelerated upwards with constant acceleration 'a'. What will be the time period of the pendulum? The displacement of a particle varies according to the relation $X=4(\cos\pi t+\sin\pi t)$. Determine the amplitude of the particle. $2\frac{1}{2}+2\frac{1}{2}$

5. If there no change in the volume of a wire due to the change in its length on stretching. What is the value of Poisson's ratio of the material of the wire? A cylinder is filled with water of density 'p' up to a height 'h'. If the beaker is at rest what is the average pressure at the walls? 2+3

6. What is the moment of inertia of a thin rod of length L and mass M about an axis passing through one end and perpendicular to its length? A particle performing uniform circular motion has angular moment L. If its angular frequency is doubled and its kinetic energy halved, then the new angular momentum is? $2\frac{1}{2}+2\frac{1}{2}$

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